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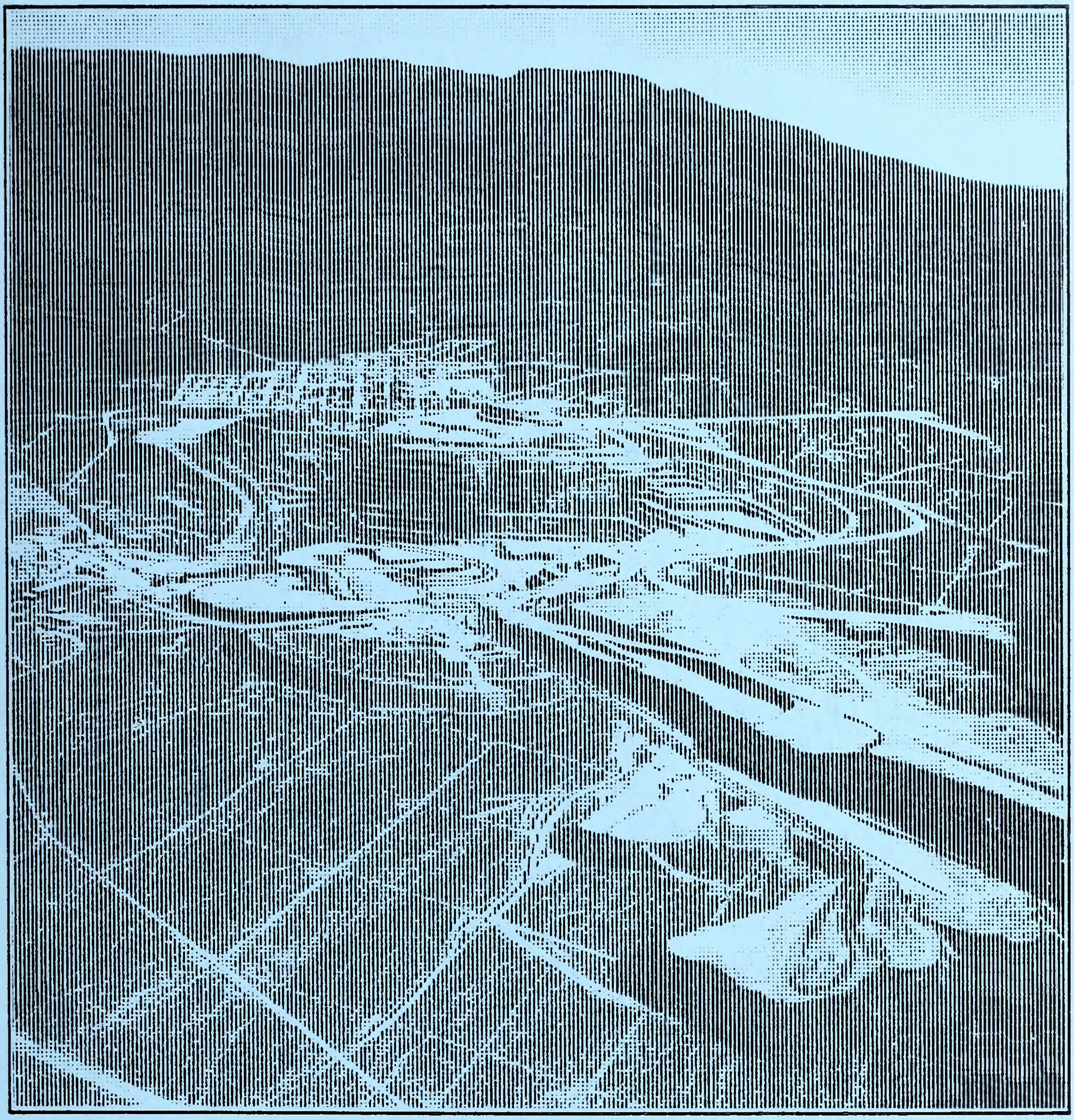

SMOKY VALLEY COMMON OPERATION EXPANSION

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ERT®
A RESOURCE ENGINEERING COMPANY

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FINAL
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SMOKY VALLEY COMMON OPERATION EXPANSION

Prepared by

BUREAU OF LAND MANAGEMENT
Tonopah Resource Area
Tonopah, Nevada

With the Assistance of

ERT, Inc.
Fort Collins, Colorado

September 1987

FINAL ENVIRONMENTAL ASSESSMENT
SMOKY VALLEY COMMON OPERATION EXPANSION

Prepared by: U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Tonopah Resource Area

With the Assistance of: ERT
1716 Heath Parkway
Fort Collins, Colorado

Abstract: This Final Environmental Assessment (EA) presents the conclusions of environmental analyses of Round Mountain Gold Corporation's proposed expansion of the Smoky Valley Common Operation, a precious metals extraction operation in Nye County, Nevada. The proposed expansion would increase ore production from approximately 15,000 short tons per day (TPD) to 35,000 TPD. The expansion would involve the construction, operation, and abandonment of ore processing and support facilities on public land and construction of a housing development for new employees on private land near the SVCO. The proposed project is described in a Plan of Operations submitted to the Bureau of Land Management (BLM), Tonopah Resource Area Office, which is responsible for reviewing the plan to determine compliance with BLM regulations governing surface mining under the General Mining Laws. As part of BLM's review process, this EA describes the projected impacts of the proposed mining operation on the natural and human environment. Based on public input and the design of the proposed facilities, the analysis emphasizes the following affected resources: air quality; groundwater quality and quantity; soils and reclamation potential; vegetation; wildlife; cultural resources; socioeconomics and community resources; and aesthetics. The analysis considers the No Action Alternative, three mining and processing alternatives, two employee housing alternatives, and three reclamation alternatives.

SUMMARY

Introduction

This Environmental Assessment (EA) presents the conclusions of environmental analyses of the proposed expansion of the Smoky Valley Common Operation (SVCO), an existing precious metals mining and heap leach operation at Round Mountain, Nevada about 60 miles northeast of Tonopah. The expansion of the SVCO would involve the construction, operation, and abandonment of facilities for extracting and processing gold/silver ore. The proposed expansion is described in a Plan of Operations submitted to the Bureau of Land Management (BLM), Tonopah Resource Area Office, which is responsible for reviewing the plan to determine compliance with BLM regulations governing surface mining under the General Mining Laws. The EA analyzes the projected impacts of the proposed mining operation on the natural and human environment.

Round Mountain Gold Corporation (RMGC) proposes to mine approximately 12 million tons of ore per year and process the ore by a cyanide heap leach method. The plant would produce 300,000 to 350,000 troy ounces of gold and 150,000 to 200,000 troy ounces of silver per year for an estimated 15 years of operations, based on current estimates of mineral reserves.

Major components of the project would include expansion of the open-pit mine and waste rock dumps; construction of a permanent, reusable leach pad; a new leach residue disposal area; a new processing plant; and new ancillary support facilities (administration building, laboratories, change house, truck shop/warehouse, and security gate house). The new surface disturbance on public lands would total approximately 2,300 acres.

In order to provide housing for new employees associated with the expansion, RMGC plans to develop its Christensen Ranch property located approximately 3.5 miles west of the minesite in the Big Smoky Valley. This new village would contain residential and commercial development and recreational facilities.

Alternatives to the proposed action are analyzed in the EA. Alternatives considered in detail in the analysis include: the No Action Alternative; mining and processing alternatives; employee housing alternatives; and reclamation alternatives. The EA also briefly documents several alternatives that were considered during early project design or during the environmental analysis but which were eliminated from detailed consideration because they were judged to be technically or economically infeasible, and they did not provide environmental advantages over the proposed expansion plans.

Public Involvement

A public scoping process was conducted prior to preparing the EA. This process included mailings of public information documents, two public meetings in the communities of Tonopah and Round Mountain, a 30-day written comment period, and meetings with local government officials. The scoping process identified the following potentially affected resource areas for analysis in the EA:

- Socioeconomics
- Cultural Resources
- Water Resources
- Wildlife
- Vegetation and Livestock Grazing
- Land Use and Recreation
- Visual Resources
- Transportation

The Draft Environmental Assessment was circulated for review by federal, state, and local government agencies and interested individuals; two public meetings were held in Round Mountain and Tonopah during the public comment period. The majority of the comments made at the public meetings were specific questions about the proposed expansion itself. Letters of comment and specific responses are included in Chapter 4 of the EA. This Final EA reflects both verbal and written comments received during the public comment period.

Finding of No Significant Impact

Based on the Environmental Assessment and the results of the formal scoping process and public review of the EA, BLM has concluded the proposed expansion of the Smoky Valley Common Operation will not result in significant impacts to the environment. An environmental impact statement will not be prepared. The major factors used by BLM in determining the Finding of No Significant Impact are summarized below.

The SVCO expansion would result in impacts onsite, such as soils and vegetation disturbance, and would induce both beneficial and adverse impacts to communities in the region. The development would occur in a region in which mining is an important and accepted land use; with the implementation of project alternatives and recommended mitigation measures, projected impacts are not judged to be significant.

The proposed expansion would meet the standards of BLM regulations governing surface management of public lands under the General Mining Laws (43 CFR 3809). Implementation of the project as described in RMGC's Plan of Operations, including mitigation measures identified in the EA, would not result in the undue or unnecessary degradation of public lands.

Air Resources

The proposed expansion would result in increased particulate matter (PM) emissions from mining, ore and waste transfer and handling, and heap leach operations. Projected emissions would meet applicable State of Nevada air quality standards. Air pollutant emissions and control technologies are subject to review and approval by the Nevada Division of Environmental Protection (NDEP). Permit applications have been discussed with NDEP and will be submitted by RMGC.

Geology and Mineral Resources

The proposed expansion would extract economically viable gold and silver reserves. It would not interfere with future resource recovery efforts. Proposed designs for the mine and other facilities recognize and account for seismic and other geologic hazards in the area. Slopes on proposed waste dumps could be unstable over the long term unless they are reduced or constructed with benches.

Water Resources

The new wells associated with the proposed expansion and the new village are not expected to affect the natural groundwater recharge rate. No adverse impacts to groundwater quality are anticipated. There are no perennial streams on the project site; no adverse impacts to surface water would occur from the proposed expansion.

Soils

Construction and operation of the proposed expansion would disturb approximately 2,300 acres of soil resources. Loss of soil resources would result from accelerated water and wind erosion and buried suitable topsoil material. Long-term impacts to soils would vary depending upon the reclamation alternative eventually implemented. Impacts would be greatest under Reclamation Alternative A where suitable topsoil would not be salvaged and revegetation would rely on natural revegetation. This would result in large exposed areas subject to wind and water erosion problems for an extended period of time. Topsoiling and revegetation (Alternatives B and C) would reduce these long-term impacts associated with soil erosion by increasing revegetation potential and promoting long-term stabilization of treated areas.

Vegetation

Impacts associated with the proposed expansion would include vegetation removal and loss or reduction of plant productivity. Approximately 2,300 acres across five vegetation types would be affected by construction activities. Total production losses would range from about 467,700 to 813,600 pounds of air-dry herbage per year for the 15-year life of the project. This corresponds to a loss of 149 AUMs/year which is not considered a significant impact to grazing potential.

Vegetative cover and productivity will gradually be restored on disturbed areas. The rate of recovery will be dependent on the level of reclamation selected.

No impacts to federal threatened, endangered, or candidate plant species or state listed plant species are expected to occur.

Wildlife

The proposed mine expansion would affect local populations of small mammals, songbirds, and reptiles. No major impacts to other wildlife species or regional wildlife populations would be expected.

Approximately 2,300 acres of wildlife habitat would be impacted resulting in loss of prey species which would affect local populations of area predators and raptors. Habitat losses would extend beyond the life of the project depending upon selected reclamation practices. Impacts of habitat loss to big game species would be minimal.

Potential impacts to waterfowl and other wildlife species resulting from cyanide poisoning at the solution ponds is a concern. Some waterfowl kills and perhaps deaths of other wildlife may occur. If significant mortality rates are observed, mitigation measures would be necessary.

Potential indirect wildlife impacts resulting from increased human activity (e.g., road kills, hunting, harassment) would be of concern if construction workers camp on public lands.

Land Use and Recreation

Land Use. Expansion of the SVCO would be consistent with federal and Nye County land use plans for the area and would be compatible with surrounding land uses. Approximately 149 AUMs of grazing capacity would be lost per year of disturbance but this would not be a significant amount. The expansion is located within the Smoky allotment which has three permittees who are licensed to graze livestock. Post-mining land use could return to rangeland/wildlife habitat for a portion of the site, depending on the reclamation alternative selected.

Recreation. The proposed expansion would not adversely affect the recreation resources in the project area. Recreation opportunities in the Big Smoky Valley would be enhanced by the facilities proposed for the new village.

Cultural Resources

Cultural resource sites would be directly and indirectly impacted. A testing program is being designed in consultation with the BLM and the Nevada State Historic Preservation Officer. The program is designed to evaluate the importance of the cultural resource sites in terms of their significance and eligibility for nomination to the National Register of Historic Places. Site-specific mitigation for cultural resources is included in the Record of Decision.

Aesthetics

Visual Resources. The SVCO expansion would unavoidably alter the visual character of the project area. It would increase the visual contrast in an area designated for management to rehabilitate existing visual conditions. The visual effects of the expansion would be reduced by application of reclamation techniques defined under Reclamation Alternatives B or C and construction of the proposed leach residue pile from east to west to the extent feasible.

Noise. Expansion of the SVCO would unavoidably increase noise emissions to a slight degree but neither the increase nor the resulting total noise levels would be significant at the nearest sensitive receptors.

Socioeconomics

Population. Expansion of the SVCO would increase area population by nearly 650 during peak construction activity and by slightly less than 200 over the life of the project. These would be moderate increases generating the beneficial and adverse effects described below.

Economy. The SVCO expansion would reinforce the mining industry in Nye County. The expansion would increase employment in Nye County during construction by an average of 334 workers from 1987 to 1988, and by 107 workers during operations. Nye County would experience a considerable increase in revenues from property, net proceeds, and sales taxes directly paid by RMGC and indirectly from mine workers who own property and spend their earnings in the local communities. Community facilities and services could improve due to the increased population base, if new revenues are allocated for community facilities such as parks and recreation, library, schools, and road improvements.

Employment. Nye County mining employment would increase moderately generating minor secondary employment increases in other sectors of the economy. The greatest employment increase would be 462 construction workers and 83 indirect employees during the peak construction activity in mid-1988. Over the long term, 70 permanent workers would be added at the SVCO and an estimated 37 jobs would be created in other sectors.

Fiscal Effects. During the construction period, expansion of the SVCO would result in short-term, negative net fiscal effects on public service providers faced with major capital expenditures. These would include the school district and the town of Round Mountain. Over the long term, however, increased property tax, sales tax, and net proceeds tax revenues would provide positive net fiscal effects on all jurisdictions.

Housing. The proposed expansion would generate a net increase in demand for short-term rental housing during construction that would exceed the available supply in the Big Smoky Valley. Tonopah has a sufficient supply to accommodate the overflow unless timing of the peak SVCO-related demand conflicts with the demand from a major military exercise. Over the long term, the SVCO expansion would increase the Big Smoky Valley net housing supply to accommodate the increased demand.

Public Facilities and Services. Expansion of the SVCO would increase school enrollment by approximately 80 children in Round Mountain. The Round Mountain school is already at capacity and operating with some temporary classrooms. The expansion would also result in many Round Mountain residents moving to the new village approximately 3.5 miles distant from existing public facilities, such as fire, police, schools, library, and post office. Social service agencies may face short-term increases in service demands with no commensurate increase in staff or resources. Other public services and facilities have sufficient capacity to accommodate SVCO expansion-related demand with no significant adverse effects.

Transportation

The SVCO expansion would increase traffic levels in the site vicinity, particularly during peak hours at shift change times. The resulting traffic levels would be well below highway capacities, however, and would not significantly reduce levels of service. Consequently, transportation effects of the expansion would not be significant.

Agency Preferred Alternative

The Bureau of Land Management proposes to approve the Plan of Operations for the SVCO expansion with mitigation measures specified in the Plan. BLM also will provide specific reclamation guidelines for eventual abandonment of the mine and processing facilities.

Mining and Processing

The Agency Preferred Alternative for mining and processing is the basic Plan of Operations proposed by RMGC. RMGC can, if economic or operational conditions change, modify their Plan of Operations with BLM. The leach residue dump would be located as proposed by RMGC. A 1,200-foot setback from the toe of the slope to the highway fence would be required for cattle passage. The leach residue dump would be resoiled and reseeded. The slopes of this dump would be limited to a maximum of 18°.

The site is already dominated by disturbed areas similar to that of the proposed expansion. This proposed expansion would increase the project area size and increase the visual contrast. The area is designated for rehabilitation within the visual resource management (VRM) system, and the surrounding area is classified as Class IV. This visual class enables activities which require major modification of the existing character of the landscape. The proposed expansion would dominate the view and be a major focus for the viewer. This domination can be lessened by reducing slopes and reseeding the leach residue dump. This action is consistent with VRM Class IV objectives.

Employee Housing

The preferred employee housing alternative is development of the Christensen Ranch property for new employees of the mine. No current residents of Round Mountain would be required by BLM to relocate.

The new village would house new employees and current residents who choose to relocate to private land. There would also be some SVCO employees who choose to live in Tonopah. These people would not be affected by this decision.

Reclamation

The preferred reclamation alternative incorporates portions of Reclamation Alternatives B and C. The Agency Preferred Alternative was selected by consulting the regulations and Bureau policy, consulting the proposed mine plan, incorporating public and agency comments, and by a cost analysis of the reclamation alternatives.

It is the view of the Authorized Officer based on current policy and RMGC cooperation that no bond shall be required. RMGC has agreed to the following stipulations that are specified in the Plan of Operations:

- All surface facilities will be removed after the mining operation ceases. The building foundations will either be covered by topsoil on site or removed to a disposal area at the discretion of the Authorized Officer.

- Topsoil from the leach residue dump area will be stripped to a depth of 12 inches and reapplied to a depth of 10 inches.

- Topsoil from the leach residue area will be stockpiled for future use. Concurrent reclamation of the leach residue dump will be part of the mine plan. The topsoil of the first dump will be stockpiled for future application. As soon as the first leach residue dump lift is completed, topsoil will be reapplied. Live handling of the topsoil is encouraged to reduce on topsoil storage areas.

- Slopes of the leach residue dump will be left at angles of 18° or less. These reduced slopes will facilitate the operation of reclamation equipment. The leach residue dump can be constructed in lifts of 25 to 35 feet to aid in final slope contouring.

- Benches will be left in the mine pit for safety.

- The waste rock dumps will not be resoiled. Final slopes will be reduced to 25° or less. Final slopes can be constructed in 25 to 50-foot lifts to meet the final slope contour. A study will be undertaken by BLM and RMGC on an already abandoned waste dump. Alternative soil treatments will be analyzed for the waste dump to determine the best approach to maximize vegetation and minimize soil erosion by wind or rain. The waste dump revegetation study will be completed within 1 year of the signed Record of Decision for the SVCO expansion. The study will provide a report which will be a comprehensive guide to the ultimate reclamation of the waste rock dumps.

- Roads, parking lots, and building areas will be scarified upon abandonment to relieve compaction. These areas will be reseeded with a seed mix prescribed by the Authorized Officer.

- Revegetation will include seeding all areas that are resoiled. This seed mix will be of native species adapted to the area. Pure live seed will be specified. The seed will be drilled where possible. Broadcast rates will be triple those of drill rates.

- Upon abandonment of the operation, the mine pit perimeter will be security fenced. One road will be left into the pit for access.

- As lots become vacant in the Round Mountain townsite, RMGC will remove utilities or make them inoperative and grade lots to a natural slope for drainage. This applies only to the trailor lots built by the mine under previous plans of operation.

- A yearly progress report of the operation will be provided to the Tonopah office of BLM.

The following additional measures to mitigate impacts to wildlife, livestock, and cultural resources have been specified in the Plan of Operations.

- If mortalities of birdlife occur at cyanide sumps, mitigation to prevent deaths will be initiated.

- Fencing of the new townsite and airport is necessary to preclude livestock. One continuous fence will be constructed. The fence should be built to avoid livestock traps. The fence will be built to four strand BLM specification, non-antelope fencing.

- The mine area will be fenced as described in the Plan to preclude livestock. The fence will be built to four strand BLM specification, non-antelope fencing.

- A 1,200-foot setback from the State highway will be maintained in the leach residue dump area.

- The Fairview Mining Complex will be tested to determine National Register eligibility. If determined eligible, a data recovery plan will be implemented.

- The Shoshone dugout will be fenced to prevent degradation. The site will be monitored for any further degradation and vandalism. The fence will be 8-foot chain link with barbed wire on the top. If protection is inadequate, testing will take place.

- The Jefferson-Shoshone pipeline will have an avoidance or documentation plan implemented.

These archaeological mitigations are subject to State Historic Preservation Office concurrence.

The completed Record of Decision for the expansion of the Smoky Valley Common Operation is on file in the Tonopah Resource Area office of the BLM.

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PURPOSE AND NEED FOR ACTION

This Environmental Assessment (EA) describes the potential environmental impacts of Round Mountain Gold Corporation's (RMGC) proposed expansion of the Smoky Valley Common Operation (SVCO), a precious metals mine and processing operation. The project is located in Nye County, Nevada, approximately 60 miles northeast of Tonopah. The proposed expansion would increase ore production from approximately 15,000 short tons per day (TPD) to 35,000 TPD. The expansion would involve the construction, operation, and abandonment of processing and support facilities on public land and the construction of housing for new employees on private land near the SVCO.

An estimated 184 million tons of gold/silver ore would be mined over the 15-year life of the expanded operation. Total precious metals production is estimated at 4.9 million ounces of gold and 2.6 million ounces of silver during this period.

Gold and silver are major commodities on domestic and foreign markets with extensive industrial and commercial uses. Demand in the United States has exceeded domestic production from new mines and scrap recovery in recent years, and the difference has been met with imports or reduction of existing inventories. The demand for precious metals is expected to continue, if not increase, for the remainder of the century. Additional domestic production, such as the proposed project, would reduce the need to import gold and silver and would improve the country's foreign trade balance.

RMGC's proposed expansion is described in a Plan of Operations submitted in December 1986 to the Bureau of Land Management (BLM), Tonopah Resource Area Office. Because the proposed mine and processing facilities would be located on unpatented mining claims administered by the BLM, the operations are required to comply with procedures and standards described in BLM regulations for surface mining of public lands under the General Mining Laws (43 CFR 3809). These regulations recognize the statutory right of mineral claim holders to develop federal mineral resources and encourage such development consistent with the Mining and Mineral Policy Act of 1970 and the Federal Land Policy and Management Act. The regulations require BLM to review proposed operations to ensure that: 1) adequate provisions are included to prevent undue and unnecessary degradation of federal lands; 2) measures are included to provide for reasonable reclamation; and 3) the proposed operations will comply with other applicable federal, state, and local laws and regulations.

This EA was prepared according to BLM regulations (43 CFR 3809) and the implementing regulations (40 CFR 1505) for the National Environmental Policy Act (NEPA). The purposes of the EA are to assess the potential environmental impacts of the proposed mine and heap leach operation, to determine if an Environmental Impact Statement (EIS) is required, and to aid the BLM Authorized Officer in his review of RMGC's proposed Plan of Operations.

1.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

1.1 Introduction

Round Mountain Gold Corporation (RMGC) proposes to expand production capabilities and facilities of the Smoky Valley Common Operation (SVCO), at Round Mountain, Nevada. The SVCO is operated by RMGC which is a wholly-owned subsidiary of Echo Bay Mines Ltd. (of Canada), and holder of a 50 percent interest in the SVCO. Felmont Oil Corp. (a subsidiary of Homestake Mining Co.) and Case, Pomeroy & Company, Inc. each hold a 25 percent interest.

Round Mountain is situated in Nye County, Nevada approximately 60 miles northeast of Tonopah on State Highway 376 (Figure 1-1). The project would affect parts of Sections 23, 24, 25, 26, 35, and 36 of T10N R43E, and Sections 19, 20, 29, 30, and 31 of T10N R44E. Gold and silver are produced at the SVCO by heap leach extraction methods. RMGC proposes to double ore production from roughly 15,000 (short) tons per day (TPD) to 35,000 TPD by expanding the existing pit in a southeasterly direction to access additional reserves. This expansion activity would require the construction of new support facilities and additional employee housing. The expansion, scheduled to begin in September 1987, is anticipated to occur over a duration of approximately four years and would extend the project life to at least the year 2002, in comparison to an anticipated one to two years remaining under current operating parameters. The expanded operation would employ a work force of approximately 470 persons.

The SVCO is located on patented and unpatented (lode and placer) mining and millsite claims administered by the Tonopah Resource Area of the Bureau of Land Management (BLM). To comply with BLM regulations (as specified in 43 CFR 3809; General Mining Laws), RMGC annually submits updates to the original operating plan submitted April 27, 1981 for BLM review, comment, and approval. The federal action sought from the BLM is approval of RMGC's proposed Plan of Operations (from 1988 forward), subject to modifications that may be required to ensure that the proposed expansion would not result in the undue or unnecessary degradation of federal lands.

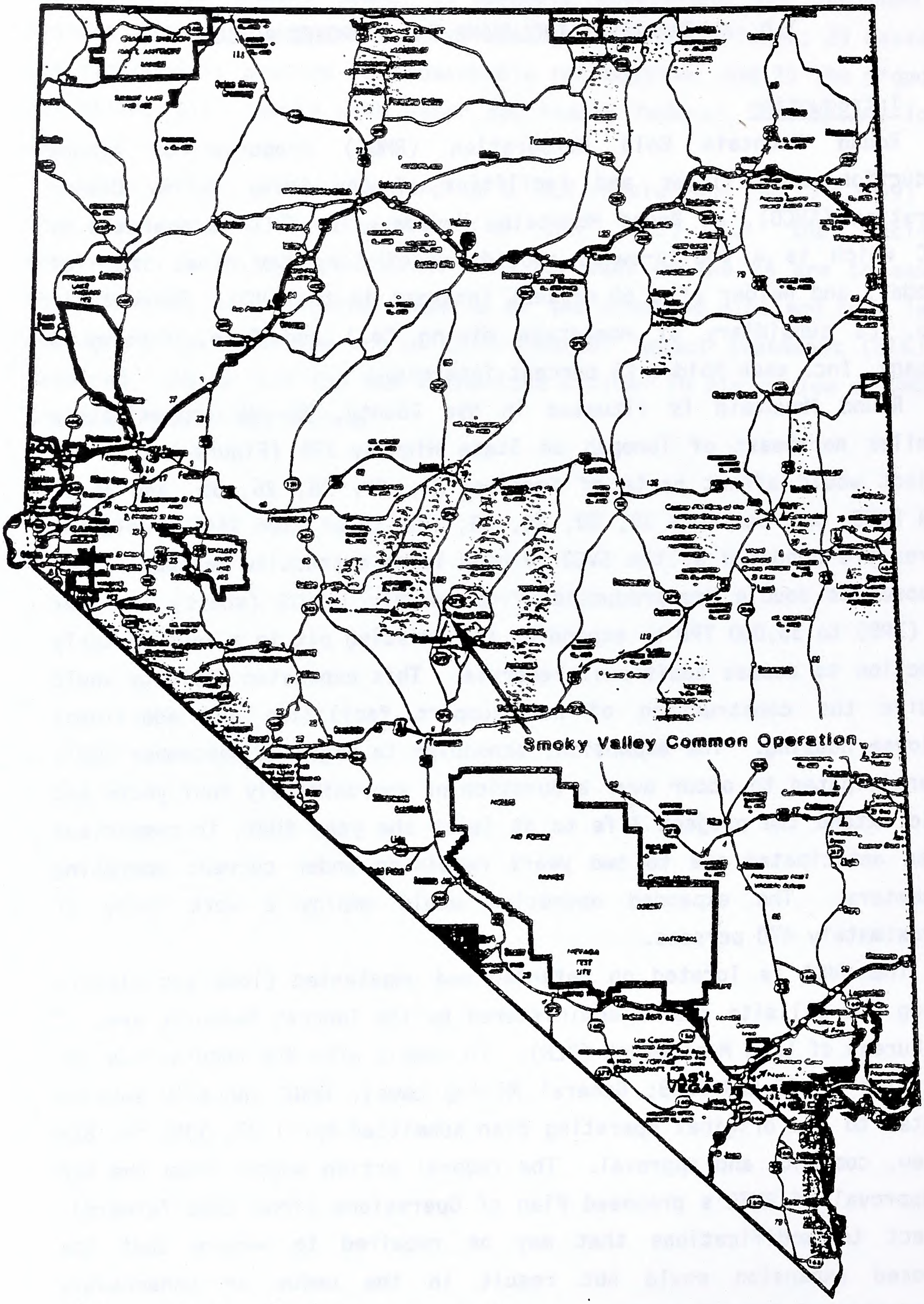


Figure 1-1. Project Location

The purpose of this Environmental Assessment (EA) is to analyze the environmental impacts of the proposed expansion, i.e., the 35,000 TPD (ore) production capability. However, in order to assess the impacts of the proposed plan, it is necessary to understand the current operations as well as expansion of the operation during the transitional phase (1987 through 1990) while preparation and "scaling up" occur. Section 1.2 describes the past and present operations at Round Mountain, and Section 1.3 describes the proposed Plan of Operations for the expansion.

The description of the existing Round Mountain operations presented in Section 1.2 is based on the original Plan of Operations for the SVCO dated April 27, 1981, and all subsequent amendments thereto. These documents are on file with the Tonopah Resource Area of the BLM. The proposed Plan of Operations (Section 1.3) is supported by preliminary and conceptual engineering which may be modified based on ongoing design engineering or the requirements of other federal, state, or local agencies with permitting or review authority (Table 1-1). Further amendments to the proposed Plan of Operations will be evaluated by the BLM to determine compliance with the applicable standards of 43 CFR 3809.

1.2 Description of Past and Present Operations

1.2.1 Site History

Early mining at Round Mountain exploited the surface alluvial deposits using placer and open-pit mining techniques from 1906 to the early 1960s. Considerable underground mining occurred during the same period, targeting the most intensely fractured zones, particularly in the "flats" area, a gently sloping area that comprises the west and northwest flanks of Round Mountain. Round Mountain is a geologic feature rising to an elevation of 6,850 feet to the east of the present day pit (Figure 1-2) and is about 350 feet higher than the surrounding topography.

Open-pit mining of the alluvial deposits in the early 1950s featured the use of a dragline-operated bank scarifier to loosen bank materials, whereupon they fell downslope to be loaded and subsequently

TABLE 1-1

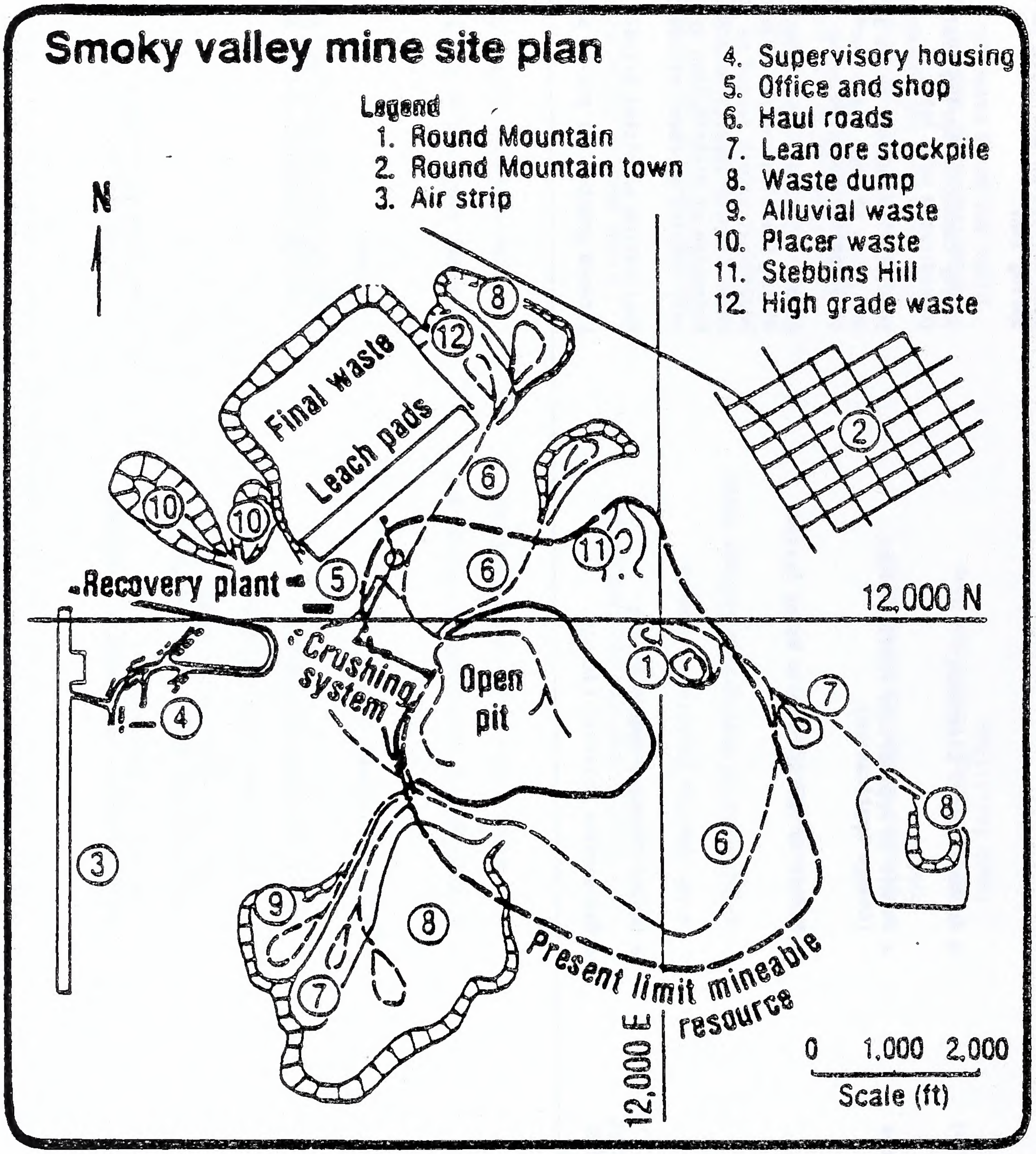
PERMIT REQUIREMENTS FOR THE SMOKY VALLEY COMMON OPERATION

Agency	Required Permit or Authorization	Status/Requirements
Federal		
Bureau of Land Management	• Environmental Assessment and Approval of Plan of Operations	Plan of Operations submitted 12/86 to initiate EA preparation and ROW applications.
	• Right-of-Way Grant for Transmission Lines and Water Supply Lines	
	• Right-of-Way Grant for Access Roads	
	• Archaeological Clearance	Survey conducted Spring 1987. (Coordinated with NV Division of Historic Preservation & Archaeology).
	• Public Airport Lease	Issued
Fish and Wildlife Service	• Compliance with Endangered Species Act	Survey conducted Spring 1987.
	• Compliance with Eagle Protection Act	Survey conducted Spring 1987.
State		
NV Division of Environmental Protection	• Air Quality Registration Certificate (Permit to Construct)	Current permits issued 6/27/86.
	• Air Quality Permits to Operate	Current permits issued 7/83 and 5/87.
	• Operation of Underground Storage Tanks	Registration received 5/87.
	• Groundwater Permit	Required prior to construction; submittal to include preliminary engineering plans and specifications.
	• Approval to Operate Solid Waste System	Solid Waste Disposal Site Operational Plan submitted and approved 7/79.
NV Division of Environmental Protection (Continued)	• Zero Discharge Permit for Heap Leach Facilities	Authorization to operate approved; plans are being reviewed.

TABLE 1-1 (CONTINUED)

Agency	Required Permit or Authorization	Status/Requirements
NV Department of Wildlife	• Modification of Habitat Permit	Data collection and field survey conducted Spring 1987.
NV Division of Historic Preservation & Archaeology	• Archaeological Clearance	Survey conducted Spring 1987. (Coordinated with BLM).
NV Division of Water Resources	• Permit to Appropriate Public Waters (Change Application)	Submittal to include point of diversion and place of use, use of water, and annual consumption; required prior to construction.
NV Division of Health	• Permit to Operate Public Water System	Permit issued 9/16/86 to Smoky Valley Mining Division expires 9/30/87; additional permit issued to Shoshone Water Company expires 9/30/87. Extension of distribution system will require approval of design plans.
	• Sewage Disposal System Permit	Application submitted 6/1/87.
NV Radiological Health Section	• Radioactive Material License	License granted for sealed source 8/86.

Figure 1-2



Source: Engineering and Mining Journal December 1985 hauled from the pit. Later operations (up to 1969) included the addition of a gravity concentration plant. More recent (1970 through 1976) studies at the site indicated the presence of lode deposits that were more attractive than the placer materials. Reserves were proven and an open-pit heap leach operation began in late 1976 with the first doré bar being cast in February 1977. Ore reserves have been increased by subsequent drilling programs, thus providing the impetus for the proposed expansion.

1.2.2 Present Operations

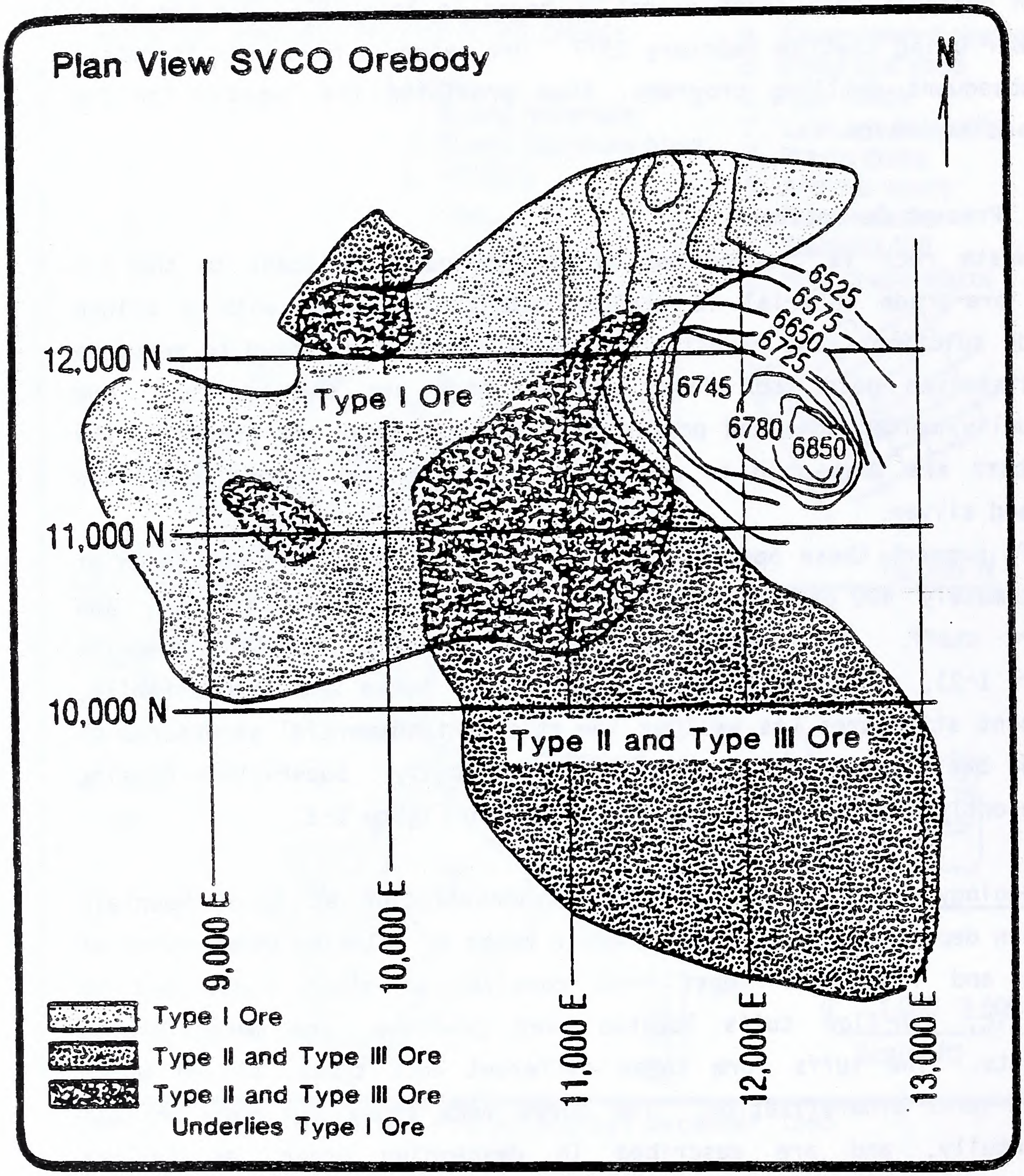
Waste rock is transported to surface dumps adjacent to the pit while ore-grade material is crushed and heap leached with a dilute cyanide solution. The resultant leachate is then processed to retrieve the dissolved gold and silver values which are then refined, and eventually melted down and poured into doré bars, the end product. The doré bars are then sold to commercial refiners for separation of the gold and silver.

To support these operations, SVCO currently employs a workforce of approximately 400 persons, including operations, administrative, and support staff. Most employees live at the Round Mountain townsite (Figure 1-2), which consists of both mobile homes and single-family, permanent structures, as well as the attendant commercial structures to provide basic goods and services to the community. Supervisory housing is presently located at the mine, as shown in Figure 1-2.

Geology and Pit Planning. Gold mineralization at Round Mountain has been deposited in the host volcanic rocks by solution penetration of faults and fractures. Host rock consists of about 1,000 feet of rhyolitic, ash-flow tuffs located over granites, and metamorphosed sediments. The tuffs form three different rock types, all of which exhibit gold mineralization. The three rock types lie more or less horizontally, and are described in descending order, as follows (Figure 1-3).

Type I:	A dense, relatively hard rhyolitic tuff approximately 350 feet thick. Gold mineralization occurs mostly in quartz-filled fractures. All mine production to date has been in Type I ore.

Figure 1-3



Source: Round Mountain Gold Corporation

Type II: Approximately 450 feet thick, this tuff is less dense, softer, and exhibits greater porosity than the Type I ore. Due to the greater porosity, gold mineralization is much more disseminated. Type II reserves form the basis for the proposed SVCO expansion.

Type III: A lithic tuff, moderately porous, and about 200 feet thick. Gold mineralization exhibits some of the characteristics of both Type I and Type II.

A fourth series, the basement rocks, (categorized as Type IV) consists of granites and metamorphosed sediments containing some gold mineralization.

Current Mine Operations. Currently, open-pit operations at SVCO produce approximately 15,000 tons of ore and 65,000 tons of waste and low-grade material per day. Both ore and waste are drilled with rotary drills and blasted using ammonium nitrate mixed with fuel oil. Grade control is provided by sampling and assaying drillhole cuttings. Loading is carried out with two 20-cubic-yard capacity hydraulic excavators, along with a smaller excavator and front-end loaders. Haulage is provided by a fleet of 50-ton, 85-ton, and 150-ton capacity trucks hauling ore to a pit-rim crusher; waste is hauled to various waste dumps.

Mine design currently utilizes 35-foot high benches. Pit access is provided by two 8 percent ramps; all haul roads are constructed of spent leach residue, routinely maintained by motor grader and water trucks for dust suppression. A large hill (Round Mountain) on the east side of the pit has contained the easternmost pit limit to date; however, waste stripping operations are moving into the hill, prestripping in advance of the major expansion effort. The existing pit size is over 3,000 feet by 2,000 feet in area and over 200 feet deep. Expansion would require the pit to be roughly tripled in area.

Blasted material, based on drill cutting assay values, is designated as ore, low-grade ore, or waste. Ore is hauled directly to a pit-rim crushing plant. Low-grade ore is dispatched (run-of-mine) to low-grade waste dumps for natural (angle of repose) size segregation and future processing. The upper portion of the pile, after stratification, results in a substantial volume (an average of 15,000 TPD) of upgraded fines that are then rehandled and leached on a low-grade heap leach pad. Waste is hauled directly to one of the designated waste dumps.

Current Processing Operations. SVCO currently uses a three-section open-circuit crushing plant configuration. Trucks dump directly onto a stockpile from which a front-end loader feeds a gyratory crusher that produces a nominal 6-inch discharge. Smaller material (<3/8 inch) is separated from the coarse material by a vibratory screen and sent directly to the fine ore stockpile. Coarse material is then subjected to a standard cone crusher (2-inch nominal discharge) after which it is again screened and routed to the fine ore stockpile or, if still oversized, to a third crushing stage consisting of twin shorthead cone crushers. The third stage product results in fine ore; oversize material becomes bottom dressing for the leach pad. The fine ore stockpile is conveyed to an automated truck bin. Lime is added enroute (for pH control) to provide as thorough a coating as possible prior to leaching.

Leach operations are continuous (three 8-hour shifts per day, 7 days per week). The bottom dressing material, referred to above, is placed atop the pad liner to provide improved leach solution percolation and flow from the bottom of the pile. Fine ore is then dumped atop the dressing and is pushed up by dozer to a height of 35 feet.

The existing leach pads are constructed of 7-inch thick asphalt containing an inner layer of synthetic material. Sized at about 3,200 feet by 280 feet, the pad slopes at 4 percent to the collection ditch which drains toward the adsorption/desorpton/refining (ADR) plant at about 1 percent. Pregnant (value bearing) solution flows directly into the ADR circuit. Leaching is accomplished by spraying a dilute cyanide solution onto the heap and allowing it to percolate downward, thus, leaching gold and silver values from the ore. Application of the spray is accomplished with a series of optimally spaced high-density polyethylene piping routed to "wobbler" spray heads. Solution is applied to the top surface of the heap and the side slopes. The leach cycle occurs for 55 to 60 days, after which the particular heap section is washed with clean water for three days (to remove residual cyanide levels) and allowed to drain. Following drainage, the heap is dismantled by front end loader and trucked to the adjacent leach residue dump. The process is then repeated by constructing a new heap section in place of the old and leaching it. A minor portion of the leach residue is used for haul road construction due to its cohesiveness and distribution of size fractions. SVCO maintains leaching operations year-round by heating the leach solution to about 58°F to 60°F prior to its application in the winter months.

Pregnant solution enters the carbon adsorption circuit where gold and silver values are loaded onto activated carbon in countercurrent carbon-in-column adsorption tanks. Loaded carbon is then pumped to a preheated stripping tank, where a stripping solution containing sodium cyanide and caustic soda is pumped through the carbon to remove the pregnant (strip) solution. The strip solution is accumulated in a holding tank for eventual electrowinning, and the stripped carbon is regenerated and reused in the adsorption circuit.

The electrowinning circuit produces a value loaded (plated) cathode that is then dried, weighed, and fluxed before fire refining. The product is a doré button, which is remelted, oxygen-lanced to remove residual iron, and cast into a doré bar containing about 65 percent gold and 35 percent silver. The doré bars are sold to commercial refiners for separation of gold and silver.

1.3 Description of the Proposed Action

1.3.1 Overview

The SVCO expansion would involve extension and enlargement of the existing pit area to provide access to the Type II ore zone, which underlies or dips beneath the currently mined Type I zone (Figure 1-3). The enlargement would double mine production rates to 35,000 TPD (ore). A doubling of ore production capability at SVCO would result in changes of similar magnitude to most ancillary or support facilities associated with the operation. The major features of the expansion include: (1) the need for additional employee housing, and (2) expansion and/or replacement of most of the mine's infrastructure. Additionally, these major changes would require upgrading of existing utilities (water and power) which must occur to accommodate the phased mine expansion activities. This section describes the proposed expansion and presents a schedule (Figure 1-4) for the principal activities.

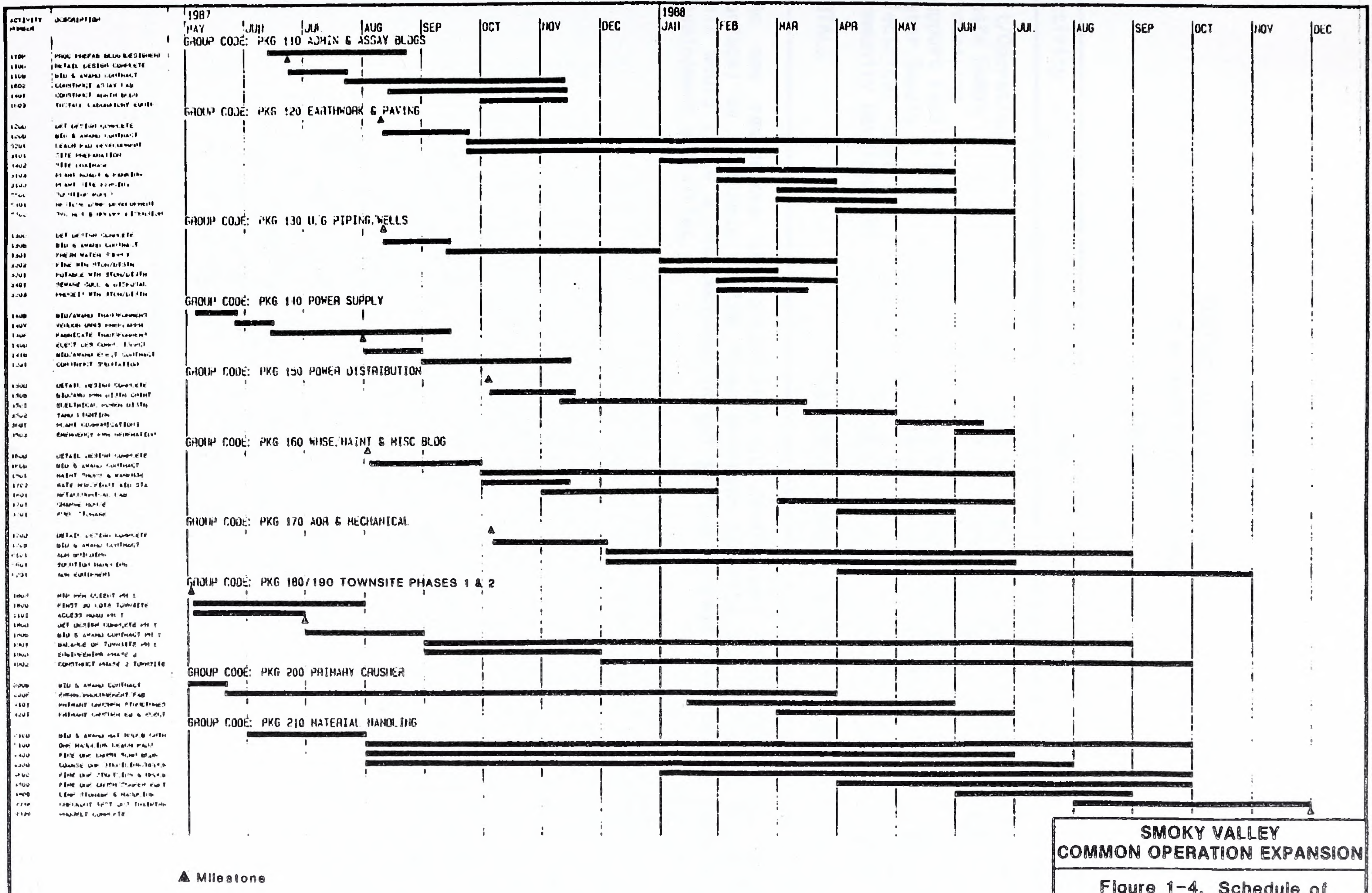
1.3.2 Project Components

Major components of the project include pit expansion in a southeasterly direction accompanied by expansion of the waste dump. SVCO proposes to develop its Christensen Ranch Property (located about 3.5 miles due west across the valley) as a planned, subdivided community for new employees and residents of Round Mountain who choose to relocate.

New support facilities would be constructed to accommodate the expanded operations. The new facilities would include a large, permanent, reusable dual leach pad that would employ a mobile stacker to load the pad; a new plant for ADR unit processes; and new ancillary structures (administration building, laboratories, change house, truck shop/warehouse, security gate house, and medical facilities). Upgraded water and electric power distribution lines would be required; these lines would be located primarily in existing corridors.

Although the ongoing definition of reserves may subsequently expand the reserve base and ultimately the project life, it is anticipated that the proposed Plan of Operations would result in new surface disturbance totalling approximately 2,300 acres. Surface disturbance due to new facility construction would primarily occur during the early expansion activities, while the areas associated with increased production (pit area and waste dumps) would experience a gradual increase in size over time to accommodate anticipated production schedules. Table 1-2 indicates projections of total affected area or surface disturbance by year through the expansion program to ultimate project life.

Figure 1-5 shows the site layout for the proposed facilities after the expansion has occurred. After completion of the expansion phase (anticipated to be mid-1990), approximately 12 to 14 million tons of ore, and approximately 35 million tons of low-grade ore and waste would be produced each year (Table 1-3). The substantial increase in production capacity would be accomplished by introducing the following improvements to the overall operation.



SMOKY VALLEY
COMMON OPERATION EXPANSION

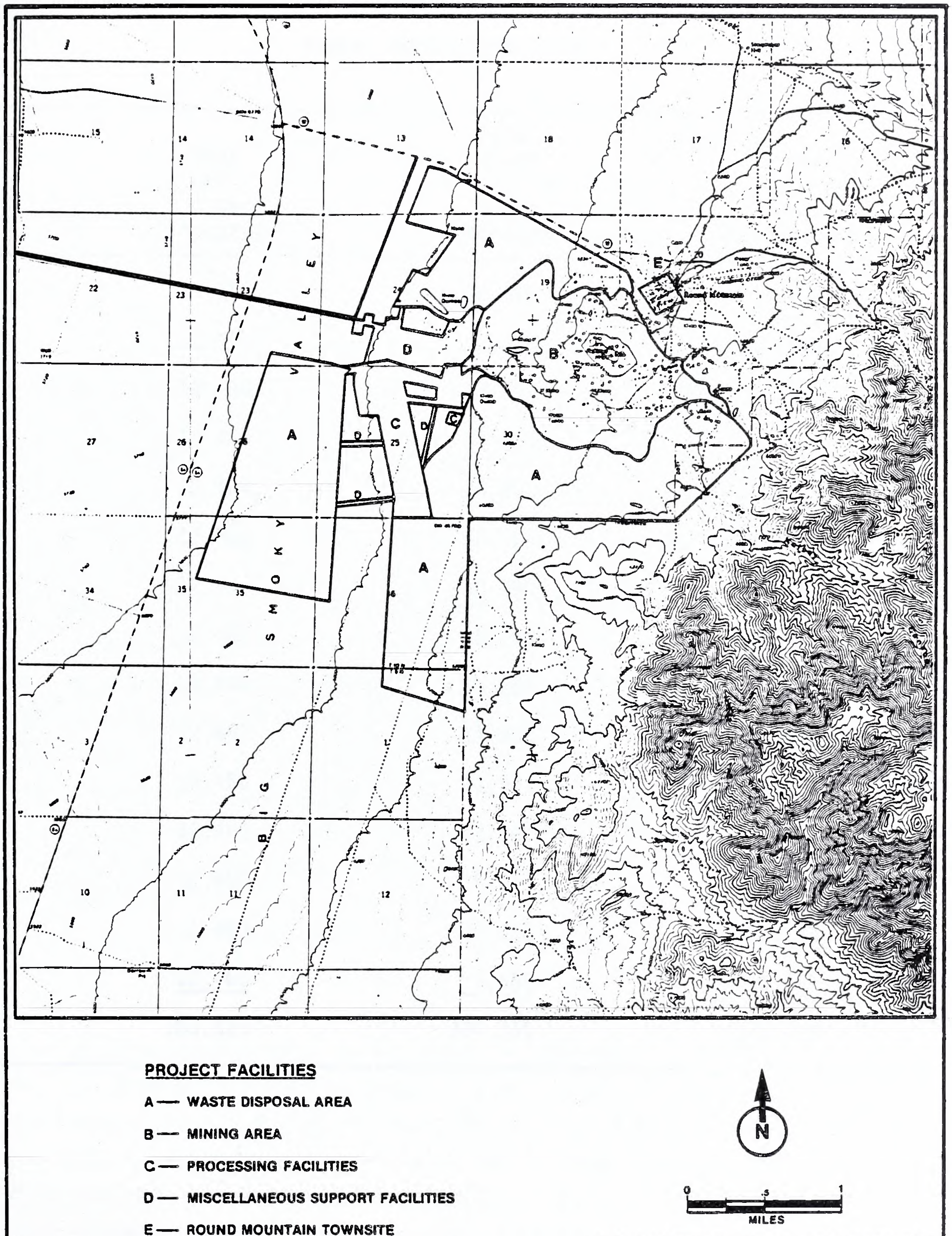
Figure 1-4. Schedule of Proposed Expansion Activities

TABLE 1-2

SURFACE AREA DISTURBANCE OF BLM ADMINISTERED LANDS (ACRES)

Activity	1987	1988	1989	1990	2002
Pit/Operations	466.4	495.3	538.3	581.5	734.7
Waste Dumps	488.0	655	738	905	2,328
Processing	72.1	224.7	224.7	224.7	224.7
Support Facilities	60.6	131.5	131.5	131.5	131.5
Water Supply	21.3	21.3	21.3	21.3	21.3
Electrical Power	3.8	3.8	3.8	3.8	3.8
Community Development[1]	96.1	90	24.2	24.2	24.2
TOTALS	1,218.5	1,621.6	1,681.8	1,892	3,468.2

[1] As new residences are established at Christensen Ranch (privately owned surface) by residents of the Round Mountain townsite who choose to relocate, this would cause a net decrease in BLM surface acreage disturbed by community development activities.



SMOKY VALLEY
COMMON OPERATION EXPANSION

Figure 1-5. Site Plan for Proposed SVCO Expansion

TABLE 1-3

ANNUAL PRODUCTION RATES

Year	Tons Ore Mined (thousands)	Tons Waste Plus Low Grade (thousands)	Total Tons Mined (thousands)
1988	9,185	38,885	48,070
1989	12,460	37,380	49,840
1990	12,460	33,820	46,280
1991	12,460	33,820	46,280
1992	12,460	30,260	42,720
1993	12,460	30,260	42,720
1994	12,460	30,260	42,720
1995	12,460	30,260	42,720
1996	12,460	30,260	42,720
1997	12,460	21,962	34,422
1998	12,460	21,962	34,422
1999	12,460	21,962	34,422
2000	12,460	15,815	28,275
2001	12,460	15,815	28,275
2002	12,460	1,669	14,129
TOTAL	183,625	394,390	578,015

- Increased capacity loading and hauling units.
- An increased number of operating benches.
- Increased crusher capacity.
- Increased leaching capability - achieved through use of a larger, reusable pad incorporating a stacker unit (as opposed to truck loading).
- Increased ADR plant capacity.

1.3.3 Mine and Processing Facilities Expansion

SVCO's expansion would require new infrastructure facilities to support the increased levels of production. In some cases, physical expansion (new construction) would occupy areas presently dedicated to other activities; in other cases, expanded production rates dictate the need for facilities in new (previously undisturbed) areas. With the exception of the material handling system (stacker) associated with the leach pile loading, all new facilities are similar to existing facilities, only larger (capacity), and physically situated to not interfere with pit expansion.

The Type II ore would require a residence time, or leaching cycle, of approximately 100 days. This is in comparison to the 55 to 60 days required for Type I ore. Somewhat poorer percolation characteristics in the heap have led to a determination that agglomeration facilities would be included in the design of the expanded operation. The increased duration of the leach cycle, as well as increased ore production, requires increased leach pad capacity and plant capacity. In terms of solution flow through the ADR plant, the expanded capability would be 4,200 gallons per minute (gpm) as compared to the current 2,300 gpm.

Main areas targeted for improvement due to expanded operations include truck maintenance facilities, change facilities, and administrative offices to accommodate the increased equipment and personnel requirements. Existing facilities, where possible, would be saved or moved to supplement the new facilities. Those structures in the way of proposed expansion would be demolished. New structures would generally be located closer to State Highway 376 by placing them immediately west of the current security/administration area. Access roads would be upgraded as described in Section 1.3.10.

The following facilities and services are required to support expanded operations. Proposed locations for the major structures are as indicated in Figure 1-6.

- Administration Building
- Metallurgical Laboratory/Leach Pad Workshop
- Assay Laboratory
- Gatehouse and First Aid Station
- Truckshop, Warehouse, Maintenance Offices, and Change Facilities
- Power Distribution
- Fresh Water Supply and Distribution
- Potable Water Treatment and Distribution
- Sewage Collection and Treatment
- Fire Protection
- Building Heating, Ventilation, and Air Conditioning
- Dust Collection
- Fuel Storage for Light Vehicles
- Vehicle Roadways and Parking
- Security

Sequentually, operational methods would not change except for the enhancements described above. Brief descriptions of each operational function and changes in procedure under the proposed Plan of Operations are as follows.

Drilling and Blasting. No procedural changes are anticipated, although explosives handling equipment and crew requirements would increase. Shot hole patterns may be adjusted to accommodate changing material densities.

Loading and Hauling. (Pit to crusher or pit to waste dump.) Loading practices following expansion would change in a manner to allow an increased number of working benches (up to 17 per year) to provide higher production rates as well as greater flexibility in grade control. Approximately 80 percent of the material would be loaded by 20-cubic yard capacity hydraulic excavators, the remainder by 13-cubic yard front-end loaders. The haulage truck fleet (ranging in size from 50-ton

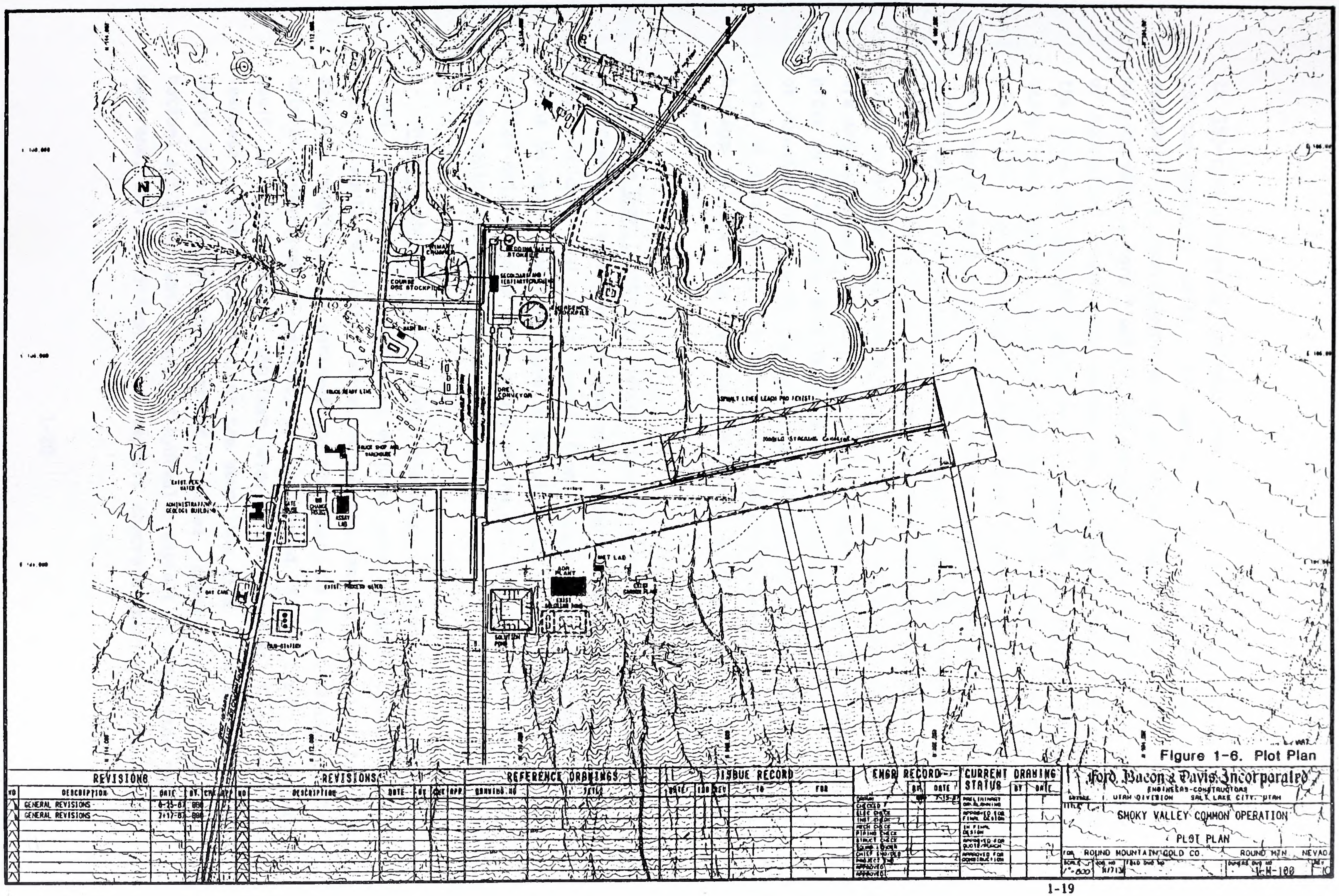


Figure 1-6. Plot Plan

to 150-ton) currently includes nine 50-ton, sixteen 85-ton, and eight 150-ton capacity units. As smaller trucks reach the end of their economic life, replacement units of larger capacity would be introduced to complement a core fleet of 150s brought on in early-1988, at the time of expansion. Fleet requirements are anticipated to be twelve 150s at the start of expanded operations, increasing to eighteen during high strip ratio years, and decreasing to fourteen units at the end of the mine life. By increasing haulage truck capacities to 150-ton units, SVCO would realize lower unit haulage costs and increased loading efficiencies. At the time of replacement of the 85-ton units, front-end loader size would also be increased from 13-cubic yards to 17-cubic yards to better match the truck size. Based on current economics, all ore and waste would be hauled by truck; however, should conveyor haulage prove to be economic at a later date, SVCO may consider the introduction of conveyor haulage to the operation to handle some portion of waste or ore. A semi-mobile, pit rim crusher would be used with the conveyor haulage network (see Section 1.4 for a description of the project alternatives).

Waste Dump Locations. Waste storage areas currently used are not sufficient in available or remaining capacity to handle the increased waste volumes that would result from expansion of operations. SVCO plans to expand dumps westward in the direction of the new leach pad and utilize existing dump areas south of the pit (Figure 1-5). Waste rock piles would also be expanded to the west.

Heap Leach Facilities. SVCO proposes to construct an asphalt lined, reusable, dual leach pad equipped with a mobile stacker unit. The pad would be located where the current landing strip is situated, oriented longitudinally northwest to southeast, to take advantage of the natural cross-slope (5 percent) of the ground (Figure 1-6). Each pad would be approximately 350 feet wide and 4,280 feet long, with a leachate collection drain along the downslope side. The asphalt liner would have a total thickness of 7 inches, consisting of (from the bottom) a 3.5-inch thick layer of hydraulic asphalt, a granulated rubber membrane, and a 3.5-inch thick asphalt concrete wearing course. Base material would be composed of compacted earth overlain by 18 inches of compacted leach residue. An asphalt tack coat would be applied prior to placement of the hydraulic asphalt layer.

Prepared ore would be placed atop the pad by means of a conveyor-fed mobile stacker (Figure 1-7). The stacker would traverse the length of the pad, stacking ore in two consecutive 20-foot lifts to a uniform 40-foot height. At the end of the pad it would pivot 180° on a prepared ramp, allowing it to traverse tha second pad in the opposite direction, in a like manner.

Leach solution, consisting of a dilute cyanide/water solution, would be uniformly applied over the ore for a period approximating 100 days. The solution would extract the gold and silver from the ore. When maximum recovery has been achieved at the end of the 100 days, the spent ore (leach residue) would be ready for disposal, after which the pad would be prepared with new ore for the next leach cycle. Following leaching, the ore would be rinsed with clean water.

Through 1989, leach residue would be removed with front-end loaders and trucks. Removal and disposal of the leach residue may ultimately be accomplished with a mobile reclaimer operating in a similar fashion to the previously described stacker. A rotating drum would excavate the leach residue to a pre-determined level or depth, within 2 to 3 feet of the pad itself as a 2 to 3-foot thick layer of coarse ore would generally be placed atop the pad to provide enhanced percolation and to protect the pad surface. After picking up the leach residue, the reclaimer would discharge to a portable conveyor which would feed a radial stacker. The radial stacker, in combination with the portable conveyor, would provide the capability to construct a uniform waste dump immediately west of the pad area, as shown in Figures 1-5 and 1-8.

The heap leach pads, ponds, and leach residue dump would be fenced to exclude wildlife and livestock.

Reagent Handling. Chemical reagents would be handled as described below:

- Lime. Pulverized lime would be trucked to the site and pneumatically unloaded into a 250-ton capacity lime bin. Lime would be drawn from the bin by a screw feeder and fed directly to the ore after it exits the crushing plant on a belt conveyor.

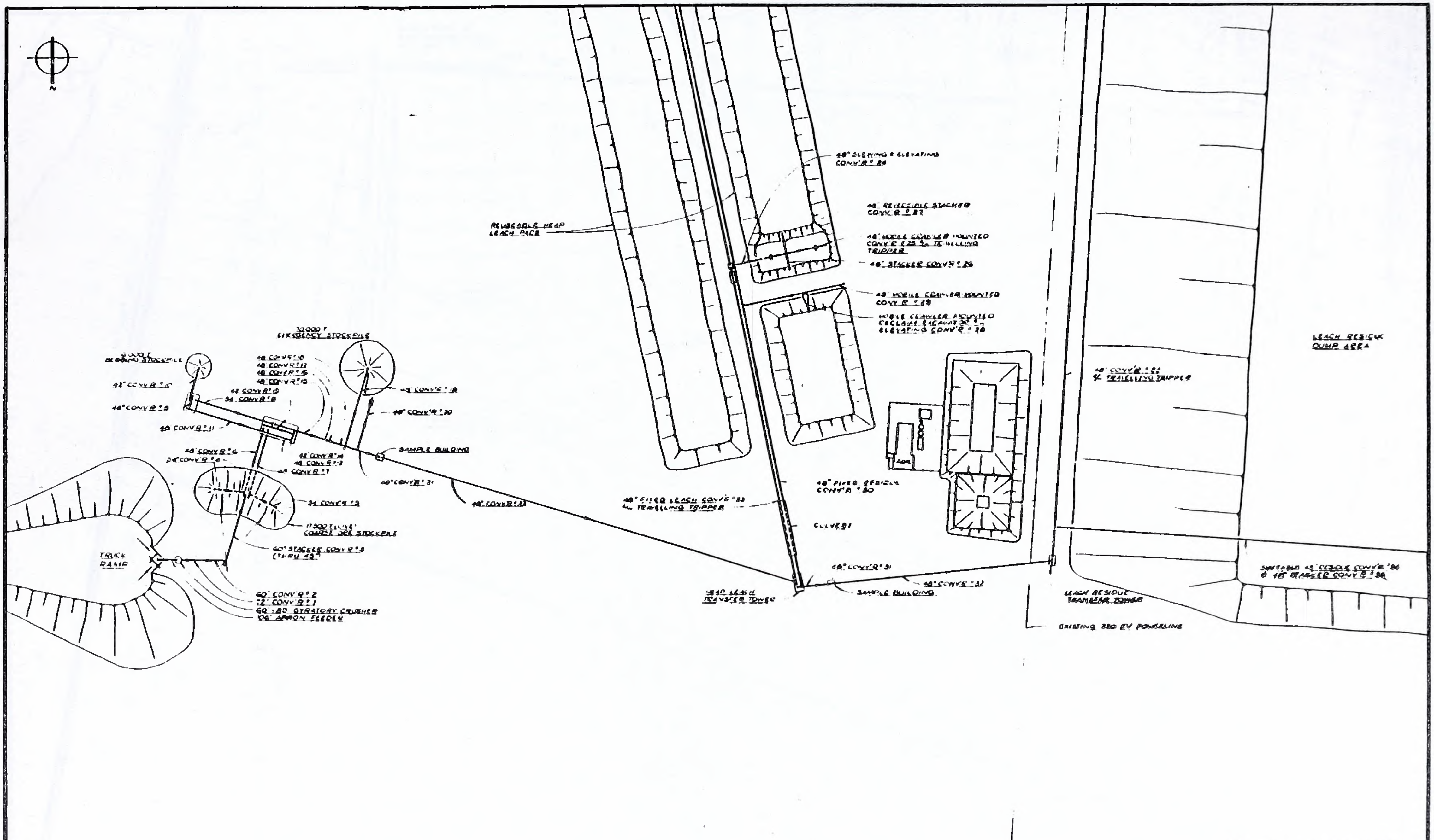


Figure 1-7. Plant Site and Conveyer Location

DWG. No.	REFERENCE DRAWINGS	No.	DESCRIPTION	DATE	BY
		B	ISSUED FOR PROJECT DEFINITION		
		A	ISSUED FOR ESTIMATING		
			REVISIONS		

SECTION GENERAL
SCALE 1" = 400'
DESIGNED BY P.C.
DRAWN BY B. COOL
CHECKED BY A.C.W.
APPROVED BY

CLIENT ROUND MOUNTAIN GOLD CORP
LOCATION ROUND MOUNTAIN NEVADA

KILBORN

TITLE
SMOKY VALLEY COMMON OPERATION
PLANT SITE
BUILDING & CONVEYOR
LOCATION - PLAN

PROJECT No. 7839
DIVISION No. 5
DRAWING NUMBER 300 A^ ^1/
REV. 0

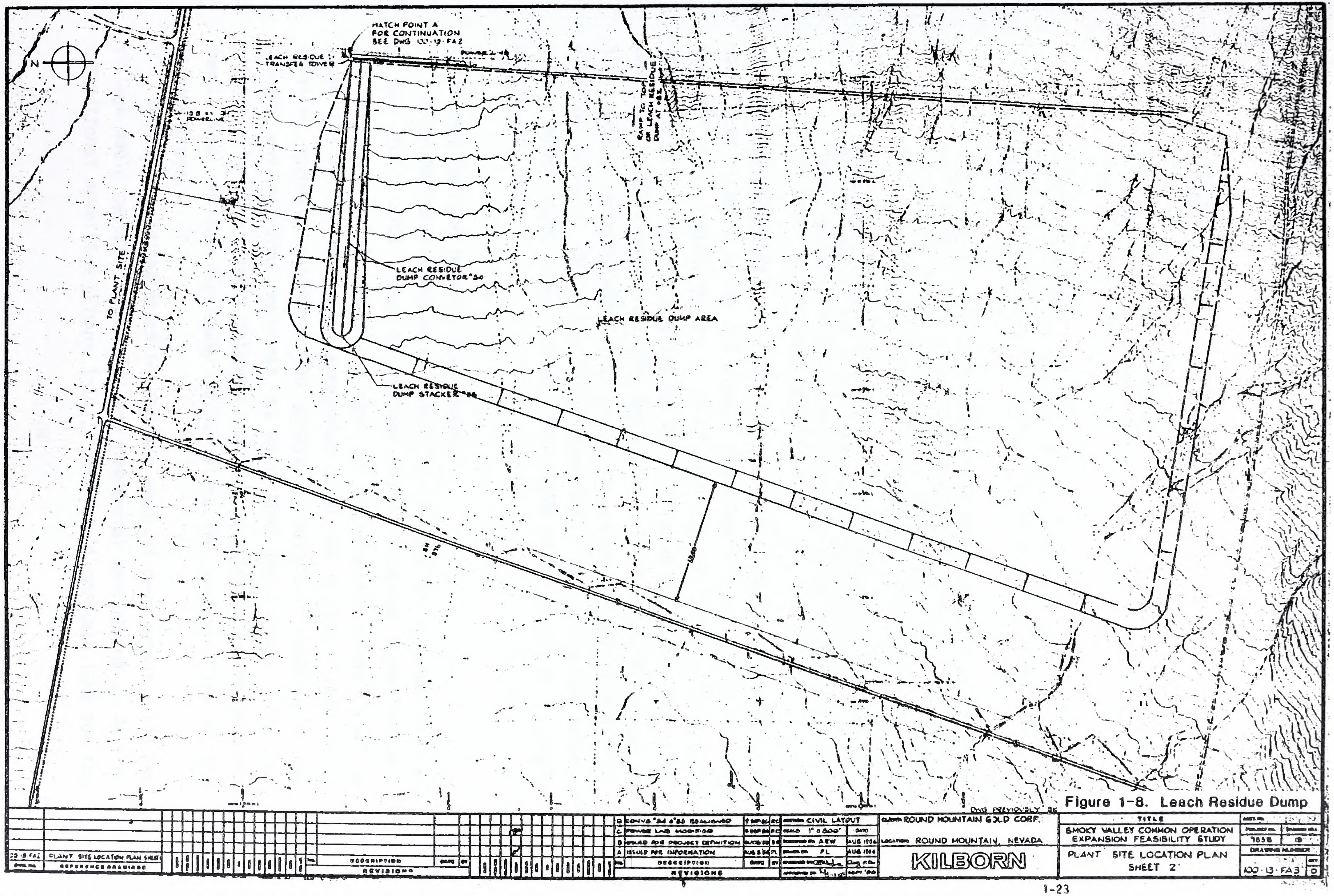


Figure 1-8. Leach Residue Dump

- Cyanide. Sodium cyanide would be delivered to the plant in 3,000-pound capacity boxes and fed directly into the electrowinning discharge pumpbox. In addition, bagged cyanide would be fed into a cyanide solution mix tank from which the cyanide solution would be pumped to a holding tank and then to the lean solution sumps.

- Sodium Hydroxide. Sodium hydroxide would be delivered in 300-pound capacity drums in pellet form. The pellets would be loaded into a solution basket in the electrowinning discharge pumpbox, as required.

- Nitric Acid. Nitric acid would be delivered by tank truck and stored on-site in a 5,000-gallon capacity nitric acid storage tank. The nitric acid would be pumped to an acid neutralization tank for discharge as required into the acid wash tank.

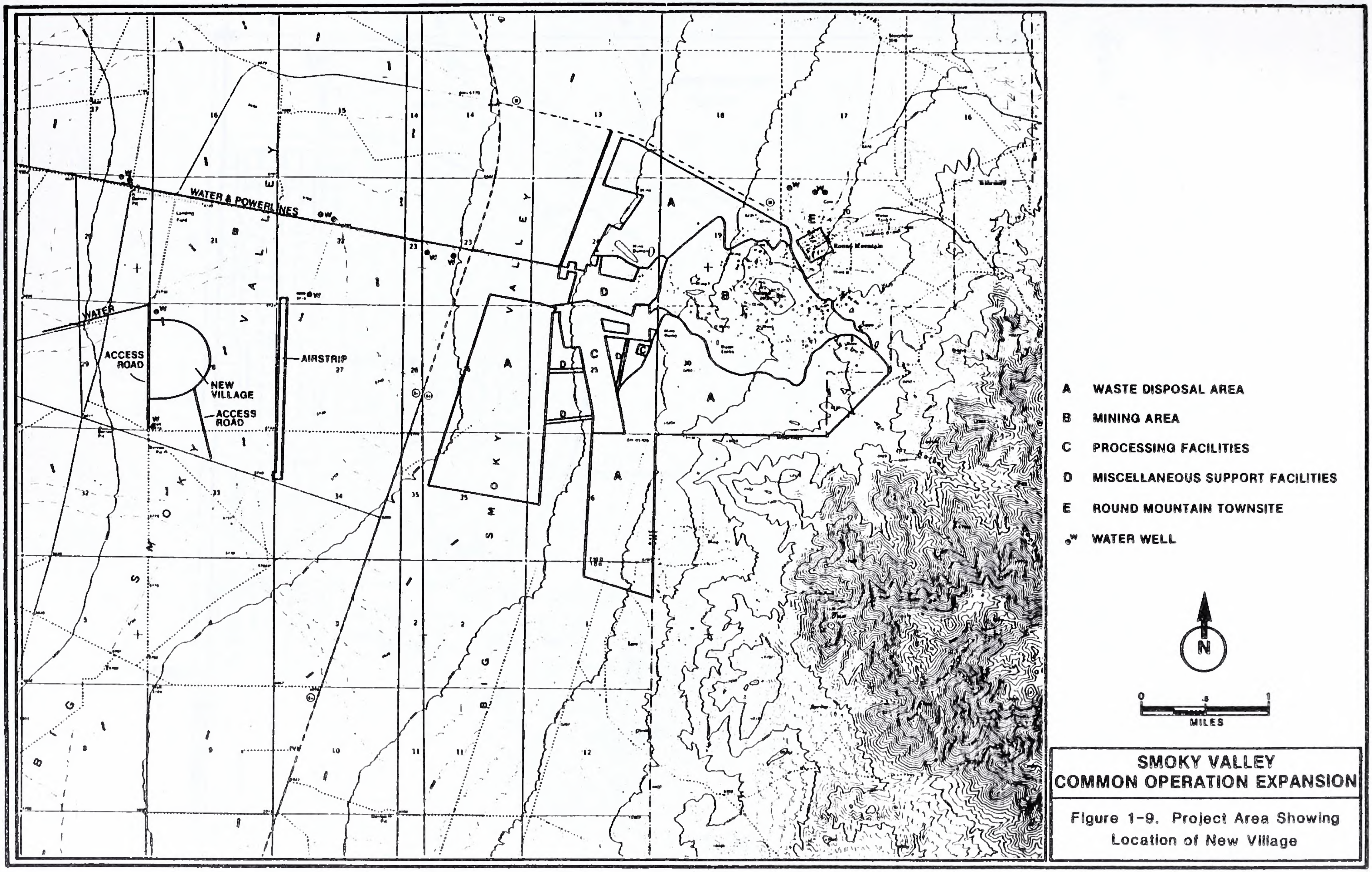
- Activated Carbon. Granular activated carbon would be delivered in bags to the site. The new carbon would be mixed with fresh water in a new carbon attrition tank, then subjected to two hours of attrition before use.

Solution Handling. All pregnant (gold and silver bearing) solution would feed directly to the ADR plant. Discharge of barren solution from the ADR plant would go to a 14 million gallon, double-lined pond utilizing 3.4 acres. The existing solution pond would be used as an emergency storm event pond. The two ponds would be connected by buried high density polyethylene (HDPE) pipelines or a spillway to transport overflow volumes. While the larger pond would be constructed with a double 40-mil HDPE liner system, the storm event pond has a single 40-mil HDPE liner.

1.3.4 New Employee Housing Development

Round Mountain townsite currently is situated on land administered by the BLM. SVCO plans to develop its Christensen Ranch property located approximately 3.5 miles west of the minesite (Figure 1-9) to house the 70 new employees associated with the expansion and those existing townsite residents who choose to relocate. RMGC will not require any existing residents to move from their homes. The new village site is presently patented land and is situated on the opposite (west) side of the Big Smoky Valley along the eastern flank of the Toiyabe Range.

SVCO purchased the ranch in 1986 for eventual development. The new village would contain residential and commercial development as well as recreational amenities (Figure 1-10). SVCO would dedicate land for the



SMOKY VALLEY
COMMON OPERATION EXPANSION

Figure 1-9. Project Area Showing Location of New Village

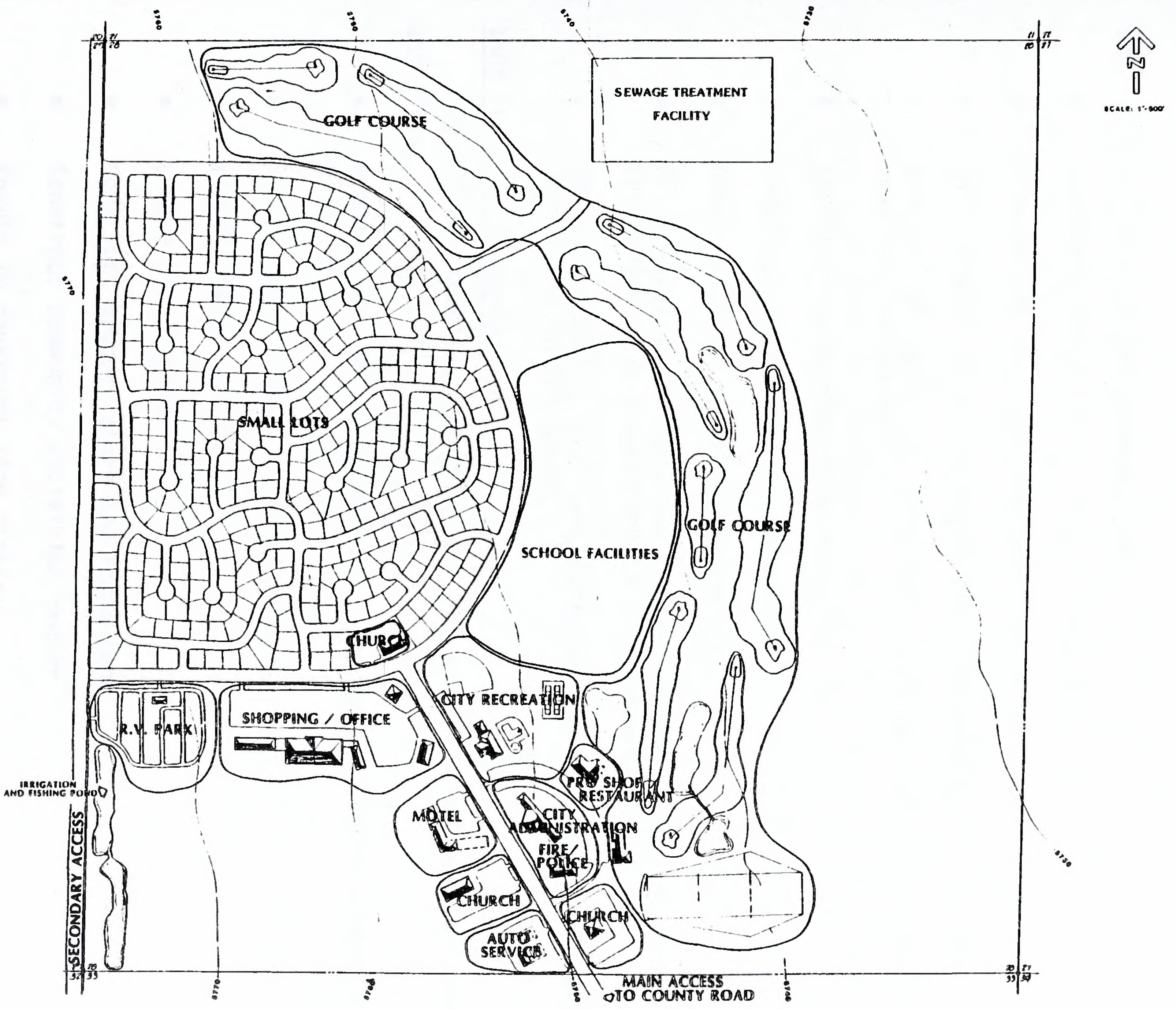


Figure 1-10.
Preliminary Master Plan
for New Village

construction of school facilities by the Nye County School District. Initial development of the site is planned for 1987, following planning and design recommendations provided by the firm of SEA Inc. (Reno). A phased development is planned, as follows.

1987 Initial Townsite Development Plans

- Construct paved access road to townsite
- Prepare 100 lot sites and paved access streets
- Move present minesite (management) residents (29) to townsite
- Prepare RV park (30 permanent hook-ups and 170 temporary hook-ups, if needed)
- Construct cafeteria-style mess hall
- . Construct sewage system (expandable)
- Construct power system (expandable)
- Drill water supply well and install treatment and distribution system for potable and fire systems (expandable)
- Install swimming pool and park facilities with 3-hole golf course and tennis courts.

1988 Townsite Expansion

The planned townsite expansion in 1988 would include the following activities:

- Prepare 100 lot sites with all services including streets by mid-1988
- Expand potable and fire water systems
- Expand sewage systems
- Expand power system
- Construct grocery store and restaurant
- Construct community activities center
- County to construct fire station
- U.S. Government to install post office

- Construct additions to recreation facilities - parks, golf course, ball field, etc.
- Construct auto service facilities[1]

1989 through 1991 Townsite Expansion

- Prepare 100 lots per year as required with all services and streets (up to a total of 435 village lots and 61 1-acre lots)
- Complete recreation facilities
- Construct village Administration Center
- Construct shopping center and offices[1]

Due to the distance between the minesite and the new village, the site services included in the initial development would be separate from those included in the mine/plant expansion (Section 1.3.2). A separate townsite water distribution system would be developed featuring two deep wells augmented by a 100,000-gallon potable water storage tank and treatment equipment. The village would also have a 100,000-gallon fire water storage tank.

The sewage treatment system would be constructed in the first year [a 150,000 gallons per day (gpd) rotating biological contactor unit]. As development progresses, all sources would be connected to the treatment plant. Effluent would discharge to a lagoon for evaporation or potential use (after polishing) as irrigation water.

Solid waste from the new village would be disposed of at the existing county landfill located between State Highway 376 and Round Mountain.

Electrical service would be provided either by a 13.8 kilovolts (kV) powerline from SVCO's main plantsite substation or from an existing substation located near Manhattan, Nevada. Distribution would be by overhead pole lines.

1.3.5 Water Supply and Distribution

Provision of the water supply and distribution system for the mine facilities would be a phased approach, starting immediately with the upgrading of the existing supply line. The water supply and distribution system has been approved by the BLM under the 1987 Plan of Operations for the SVCO.

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[1] These facilities are commercial developments planned beyond the scope of RMGC's interests, however they would be encouraged as part of the overall development of the community.

Currently, mine water is supplied from two wells located about 4.5 miles west of the property. The pipeline to the minesite was constructed of 15-inch diameter riveted spiral steel in 1915 and has deteriorated to the point where operating pressures and flow rates must be maintained at less than demand levels. To alleviate this problem, RMGC has installed a parallel, 22-inch polyethylene water line along a new, adjacent right-of-way across BLM administered lands. It is anticipated that the current wells, in conjunction with the new pipeline, would be able to fulfill mine water requirements through the early stages of expansion. In 1988, however, higher capacity production wells would be required.

RMGC has investigated potential water supply sources and there are indications that sufficient supply is available about 3.6 miles west of the proposed mine facilities site, at a depth of 110 feet. RMGC proposes to construct two 500-foot deep production wells in 1988, and connect them with the new 22-inch main. The new wells would supplement the existing wells and supply water to three new storage tanks at the minesite.

A single 100,000-gallon capacity process (makeup and wash) water tank would be located adjacent to the ADR plant (Figure 1-6), while an existing, single 200,000-gallon capacity tank on the northwest corner of the main waste dump (south of plant site) would provide all fresh and fire water requirements. An adjacent 50,000-gallon tank would provide potable water to the mine and plant. Potable supplies would be chlorinated and conform to State Health Department standards.

1.3.6 Sewage and Sanitary Waste Disposal

All sanitary sewage effluent (approximately 7,000 gallons per day) from the change house, laboratories, truckshop/warehouse, and ADR plant would be collected by buried gravity lines and directed to a primary septic tank. The septic tank would be served by a 0.22-acre leach field below the yard area, on the downslope side of the plant. Elevation differences would necessitate construction of a similar 0.12-acre system for the effluent (approximately 5,000 gallons per day) from the administration building, gatehouse, and crushing building. All systems would conform to State of Nevada and County regulations governing sewage disposal systems.

1.3.7 Solid Waste Disposal

SVCO currently disposes of non-hazardous solid waste through a series of below-grade trenches at the minesite. The minesite refuse trenches are constructed by dozer, approximately 12 feet wide, 10 feet deep, and 100 feet long. These trenches are placed at locations in the path of an advancing waste rock dump, yet where they are visually obscured from public view. When a trench is filled to capacity, a new one is constructed and the waste dump advances over the old one. SVCO would continue this solid waste handling procedure after expansion.

1.3.8 Fuel Storage and Distribution

The main fuel/oil storage compound is located south of the existing mine service complex. It consists of two 200,000-gallon diesel storage tanks and one 13,000-gallon unleaded gasoline storage tank. All tanks are above ground. Miscellaneous tanks containing hydraulic fluids and drummed lubricants are also stored at this location. No enlargement of this compound or storage tankage has been provided for, as this facility would accommodate the expansion plans. All fuels are received by tank trucks from off-site.

A secondary fuel storage compound for light vehicles is proposed north of the truckshop/warehouse complex, adjacent to the minesite access road. This compound would contain four 5,000-gallon diesel fuel tanks and one 1,000-gallon gasoline storage tank. The vertical fuel tanks would be maintained above grade on a gravel pad within a bermed enclosure sized to contain a volume equivalent to the largest tank plus 10 percent of the remaining tanks. The tanks would be leased from a fuel supplier and designed to American Petroleum Institute standards for outside storage tanks not under pressure. A pumping facility is provided to unload the tank trucks and transfer fuel into the storage tanks. Diesel and gasoline pumping stations are provided adjacent to the tanks for filling mine and plant mobile equipment.

Diesel fuel for mine haul trucks would be dispersed at the minesite from fuel tank trucks on ramped platforms or from the main fuel compound.

Heating fuel supply would be from individual propane storage systems for each building. Propane would be delivered to the site by bulk tank truck to the independent facilities. Tanks and vaporizer equipment would be leased from a propane supplier and located near the demand centers to reduce lengths of buried pipelines.

1.3.9 Power Distribution System

The existing incoming power supply is not sufficient to support the expanded operations. RMGC has contracted with Sierra Pacific Power Company to receive power at 230 kV from the existing (Austin to Nevada Moly Mine) transmission line traversing the length of the valley from north to south. The upgrading of the electrical power distribution system has been approved by the BLM under the ~~1987 Pl~~an of Operations for the SVCO.
1981 plan amended in 1987

The 230 kV substation would be located immediately northwest of the new plant location (see Figure 1-6). Two stepdown transformers would convert the 230 kV to 13.8 kV power for transmission to the plant facilities and the townsite. The transformers would be sized to allow one transformer to carry the entire plant load should the other fail.

Pole or pad-mounted transformers would be installed for permanent facilities/structures. Skid-mounted portable substations would be provided for the primary crusher and residue handling systems to facilitate future moves of this equipment.

Emergency power in the ADR plant would be provided by a 75 kV diesel-electrical generator. Building lighting and security systems would access this back-up source by means of an automatic transfer switch.

Total connected electrical load and estimated operating load data are provided in Table 1-4.

1.3.10 Roads

Primary access to the mine complex would continue to be from Nevada State Highway 376. The site access road from Highway 376 is a 20-foot wide asphalt paved road, 1 mile in length.

TABLE 1-4

ELECTRICAL AND OPERATING LOAD DATA

	Estimated Connected Load		Estimated Maximum Demand[2]
	Horsepower[1]	Kilowatts	Kilowatts
Fresh Water Supply	520	431	345
Administrative Building	100	83	66
Maintenance Shop and Warehouse	250	207	166
Laboratory	100	83	66
Change House	100	83	66
Gatehouse and First Aid	75	62	50
Village	3,000	2,486	1,989
Primary Crushing	1,805	1,496	1,197
Coarse Ore Stockpiling and Handling	1,376	1,141	912
Secondary and Tertiary Crushing	3,625	3,005	2,404
Fine Ore Stockpiling and Handling	660	547	438
Lime Storage and Handling	20	17	13
Ore Handling to Leach Pads	885	733	587
Leach Pad Development	235	195	156
Residue Handling from Leach Pad	2,650	2,196	1,757
Solution Management	1,708	1,416	1,133
ADR Building	282	234	187
	17,395	14,414	11,532

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[1] Horsepower or KVA does not include standby loads.

$$\frac{\text{Connected Horsepower} \times 0.746}{0.9} = \text{Kilowatts}$$

[2] Kilowatts x 0.8 = Maximum Demand.

Access to the Christensen Ranch (proposed new employee housing development) is currently via an 18-foot wide, gravel surfaced road approximately 2 miles long. This road is also being upgraded to a 24-foot wide, all weather road surface equipped with adequate drainage culverts and ditching.

Roadways within the minesite would generally be gravel surfaced haul roads or access roads. Main haul routes would be surfaced with spent leach residue and routinely watered, to provide a cohesive binding surface that would endure repetitive truck traffic and minimize routine maintenance. Access and tributary roads would be sprayed with water or inert chemical binders to stabilize base materials and minimize dust generation.

1.3.11 Airstrip

SVCO currently maintains a private airstrip at the minesite. Expansion activities, specifically construction of the new permanent leach pad, would occupy the area presently containing the runway. SVCO plans to construct a new airstrip that would be 100 feet wide and 7,500 feet long. The airstrip would be east of the proposed townsite along the north-south section line between Sections 27 and 28 (see Figure 1-5). The new airstrip has been approved by the BLM under a Public Airport Lease.

1.3.12 Resource Protection and Pollution Controls

SVCO has included various measures in its Plan of Operations to protect existing resource values in the mine vicinity and to prevent undue and unnecessary degradation of air, water, and land quality during operations. These measures are summarized in the following paragraphs.

Mineral Resource Values. SVCO is conducting ongoing exploration activities to define the area and volume of the ore body. Condemnation drilling programs have been completed at waste dump, recovery plant, and leach pad areas to ensure that proposed locations do not contain economically recoverable minerals. Additionally, the proposed mine plan includes segregation of waste rock and low-grade ore to allow future processing of the low-grade ore as economic conditions warrant.

Fugitive Dust Control. Expansion of surface mining operations and other miscellaneous activities at the SVCO would generate fugitive dust emissions. The most important fugitive dust source would be waste/ore removal and loading at the mine, waste/ore hauling, and wind erosion from waste areas and the mine. Water or chemical dust suppression would be the primary means of dust control. Other dust control techniques would include vehicle speed control on haul, access, and in-plant roads; use of coarse gravel or leach residue on roadways; and stabilization of inactive waste dumps and storage areas.

Air Pollutant Emissions. Air pollutant emissions and their control are specifically considered by the SVCO in project design phases. Estimated emission levels, control procedures, and impacts would be detailed in a separate environmental evaluation to be submitted to the Nevada Division of Environmental Protection, Air Quality Section. The SVCO expansion would result in particulate and other air pollutant emissions during operations. Air pollutant emissions would be controlled using dry dust collectors, baghouses, and water spray systems, where appropriate. No lead, zinc, or mercury is anticipated in the ore and, as a consequence, scrubbers are not proposed for any process in the ADR building. Emission levels and pollutant concentrations would meet the stipulations of the Registration Certificate of the Nevada Division of Environmental Protection and all applicable state and federal regulations.

Reclamation. RMGC has committed to reclaiming the mine and surface facilities sites to meet the standards of BLM's surface management regulations. The intended reclamation plan includes removal of all surface facilities down to the foundations, which would be left in place. On-site roads would be ripped to relieve compaction. Steep slopes of the mine pit and waste dumps would be constructed with benches, as necessary, to provide slope stability. Topsoil materials would be stockpiled and later applied over the leach pad surface area. No seeding of disturbed areas is proposed; revegetation would rely on natural invasion. Specific reclamation approaches will be evaluated as

Reclamation Alternatives in the EA. RMGC will develop a specific reclamation approach to amend the Plan of Operations, based on the analyses conducted for the EA.

1.4 Alternatives to the Proposed Action

Based on the results of the EA scoping process (see Chapter 4 of the EA), review of the proposed Plan of Operations for expansion of the SVCO, and RMGC's engineering studies, four different types of alternatives were selected for consideration in the EA: (1) the No Action Alternative, (2) mining and processing alternatives, (3) employee housing alternatives, and (4) reclamation alternatives. These alternatives provide BLM and RMGC with flexibility in developing a final Plan of Operations.

1.4.1 No Action Alternative

Under the No Action Alternative, expansion of the SVCO would not be allowed. The No Action Alternative is required by NEPA; however, it would pose a conflict with regulations (43 CFR 3809) governing BLM management of surface land under the General Mining Laws. According to these regulations, RMGC has the legal right to extract and process the mineral resources it has claimed. BLM's responsibility is to ensure that appropriate state and federal laws, such as the Endangered Species Act and the National Historic Preservation Act, are complied with and that the mining plan would not result in undue or unnecessary degradation of federal lands. The BLM is also responsible for the specification of measures necessary to mitigate significant environmental impacts. Thus, BLM could disallow the expansion only if the proposed operations would violate one or more of the applicable standards and must specify changes in the proposed Plan of Operations needed to meet the requirements of the mining regulations.

The No Action Alternative consists of continuation of SVCO mining activities under current production rates. Under this scenario, economically recoverable reserves would be depleted by late 1987 or early 1988 due to the rapidly increasing strip ratio of the mine. At that time, the mine and plant facilities would be dismantled and reclaimed, resulting in the loss of 400 SVCO jobs plus secondary employment.

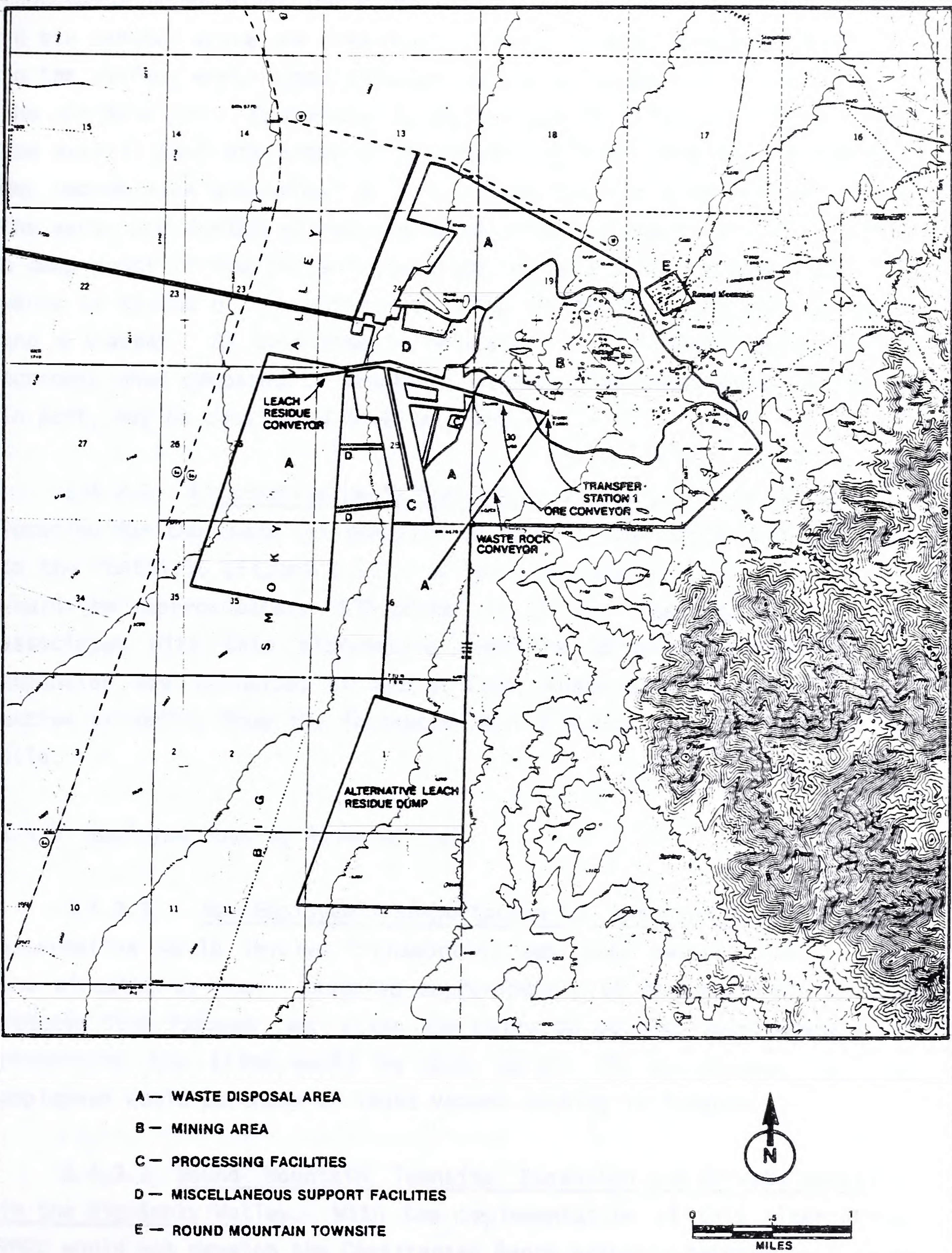
In the case of the No Action Alternative, RMGC would not develop the Christensen Ranch property as a new employee housing development. As the mine and existing plant facilities were closed, it is anticipated that SVCO employees would leave Round Mountain to seek employment elsewhere. There would be reduced tax revenues to the county and to the Nye County School District. Operation of company-owned public services would be transferred to new ownership, including water and sewer systems, day care facilities, and road maintenance. The level of services provided by the county would decrease (e.g., sheriff, school facilities, and ambulance service) in proportion to the decline in population. It is anticipated that some private retail businesses in Round Mountain would cease operation.

1.4.2 Mining and Processing Alternatives

RMGC has developed several alternatives to the proposed Plan of Operations. The various alternatives considered are the result of a series of in-depth feasibility studies. These studies centered primarily on internal operational and economic considerations of the mine and processing facilities. These alternatives are not to be considered mutually exclusive of the Proposed Action, as some alternatives, singly or in combination, may be introduced at a later date to enhance the economic attractiveness of the SVCO.

1.4.2.1 Conveyor (versus Truck) Transport of Ore from Leach Pads. Under the proposed expansion, trucks would be used to unload the leach pads and transport the leach residue to the waste dumps. If this alternative were implemented, conveyors would be installed to move the leach residue from the reusable leach pads to the waste dumps (Figure 1-11). The conveyor system would be installed in 1988 or 1989 if it is determined to be a feasible alternative.

Under this alternative, fixed residue conveyors would run the length of the pads to a transfer station where the material would be dumped onto a shiftable residue conveyor that would be used for placement of leached residue on the dump.



SMOKY VALLEY
COMMON OPERATION EXPANSION

Figure 1-11. Project Alternatives

1.4.2.2 In-pit Crushing and Conveyor Haulage of Waste Rock. Studies of waste material handling alternatives led to the conclusion that waste above elevation 6,185 feet (i.e., all material that is five to six benches above the present pit floor) is most economically trucked to the surface waste dumps adjacent to the north and south boundaries of the ultimate pit. Economical truck haulage is a function of pit depth and overall haul distance; as pit depth and haul distance increase, it may become more economical at some future date to move some portion of the waste ore through shared ore/waste in-pit crushers, and convey it to a dump south of the present low-grade ore stockpile (Figure 1-11). It would be placed on the waste dump using shiftable, extendable conveyors and a stacker. At this time, a dedicated waste crusher/conveyor is not economic when compared to trucking; however, implementation, in full or in part, may be considered in 2 to 3 years.

1.4.2.3 Alternative Leach Residue Pile Location. An alternative location for the leach residue pile is south of the leach pads, adjacent to the foothills (Figure 1-11). A leach residue pile at this location would be approximately 675 acres in size. The additional costs associated with this alternative over the 15-year operation of the expansion are estimated at $29 million; these additional costs would accrue primarily from the increased haul distance to the leach residue pile.

1.4.3 Employee Housing Alternatives

1.4.3.1. New Employee Transportation to and from Tonopah. This alternative would involve transporting employees between Tonopah, and the minesite by bus. Assuming approximately 62 new employees were to commute from Tonopah, and a bus can carry 50 people, approximately two round-trip bus trips would be made daily. It is assumed that new employees would purchase or lease vacant housing in Tonopah.

1.4.3.2 Round Mountain Townsite Expansion and Private Homesites in the Big Smoky Valley. With the implementation of this alternative, RMGC would not develop the Christensen Ranch property beyond the initial

29 homesites for SVCO management personnel. If new employee housing were not provided at the Christensen Ranch, new employees would likely purchase homesites in the Big Smoky Valley or locate on BLM land at the Round Mountain townsite.

1.4.4 Reclamation Alternatives

BLM regulations require RMGC to specify what measures will be used to reclaim areas disturbed by mining activities. RMGC has indicated its commitment to reclaim the mine and facilities area according to the requirements of the BLM regulations. RMGC chose to use the EA process for the evaluation of reclamation feasibility at the site. The EA evaluates a range of reclamation alternatives to aid BLM and RMGC in developing specific reclamation measures for the SVCO. Three reclamation alternatives are analyzed in this document. They encompass a range of possible approaches for meeting the requirements of the BLM regulations to provide for public safety and prevent undue and unnecessary degradation of public lands. Table 3.4-1 summarizes these alternatives.

Reclamation Alternative A represents a low level of reclamation. Under this option, all surface facilities would be removed after mining ceases. Foundations would be left in place; however, any hazards (such as exposed steel rebar) would be removed. Onsite roads would be ripped to relieve compaction. Steep slopes of the mine pit and waste dumps (including the leach residue dump) would be constructed with benches, as necessary, to enhance slope stability; the benches would be built as the dumps are constructed. No seeding of disturbed areas would be undertaken with this option; revegetation would rely on natural invasion.

Reclamation Alternative B represents a mid-level of effort for reclamation. It includes the measures described above for the facilities area, mine pit, waste rock disposal areas, and roads. In addition, suitable topsoil materials would be salvaged for future reapplication to the leach residue dump and leach pad area. These areas would be stripped to an average depth of 12 inches, and soil would be reapplied to a minimum depth of 10 inches. Salvaged soil materials would be stockpiled or hauled directly to areas being reclaimed. Steep slopes of the leach residue dump would be reduced to slopes of 18° (three horizontal to one vertical) or less both as an on-going process and following the completion of mining. Benches would be constructed on the steep slopes of the mine pit and dumps. The leach pad and leach residue area would be ripped where necessary to relieve compaction, resoiled, and revegetated by seeding of adapted grasses and shrubs.

Reclamation Alternative C represents the highest level of reclamation effort. Under this alternative, suitable topsoil materials would be salvaged from all disturbed areas, except the mine pit area, and directly reapplied or stockpiled for future reapplication. Direct hauling of topsoil, particularly in the leach residue dump area, would be done where feasible. Following mining, all buildings and foundations would be removed or buried substantially. Onsite roads would be ripped to relieve compaction. Steep slopes of the mine pit would be constructed with benches to enhance slope stability. All steep slopes (excluding the mine pit area) would be shaped to slopes of 18° or less. Revegetation would be attempted on all disturbance areas except the mine pit. These areas would be ripped if necessary to relieve compaction, and salvaged topsoil would be reapplied to a depth of approximately 10 inches. These areas would then be seeded with adapted grasses and shrubs.

1.5 Alternatives Eliminated from Detailed Consideration

The following alternatives to the mining and processing operations were considered by RMGC during the feasibility studies for the proposed expansion. These alternatives were eliminated from detailed analysis in the EA because they were determined to be technically or economically infeasible and they do not provide environmental advantages over the proposed expansion plans.

1.5.1 Dedicated (Versus Reusable) Leach Pads

A dedicated leach pad is a pad that is used one time to extract the values from a given quantity of ore. When that ore is leached, a new pad is built and new ore is applied for leaching. Ore is not reclaimed from these pads; it remains in-situ for perpetuity. Negative implications of this alternative include consumption or disturbance of large surface areas, increased overall construction costs in many cases, and higher heap requirements. The feasibility study demonstrated that dedicated pads are not economic even if ore were stacked to a height of 90 feet.

1.5.2 Roll Secondary Crushers

The feasibility of replacing the cone crushers with roll crushers was evaluated and eliminated from further consideration. Although roll crushers are capable of producing a coarser and often better distributed finely crushed product, the disadvantages include: 1) excessive crushing surface wear rate; 2) potential need for additional crushing stage; 3) operating problems with ores containing wet clay minerals in excess of 10 percent; and 4) lower machine capacities (700 tons per hour for cone crushers versus 250 tons per hour for roll crushers).

1.5.3 Alternative Crushing Plants

Three in-pit primary crushing facilities were evaluated for their feasibility: 1) fixed in-pit crusher; 2) mobile in-pit crusher; and 3) semi-mobile in-pit crusher. It was concluded that none of the in-pit crusher alternatives were as practical in terms of economics and operational flexibility as a semi-mobile crusher located outside the pit.

1.5.4 High-Angle Conveyors

High-angle conveyors were considered for elevating the ore from the pit. High-angle conveyors with inclination in excess of 15 degrees are useful to shorten the conveyor length and can carry materials at steeper angles, up to 90 degrees. With present technology, however, these conveyors are limited to a maximum lift of 300 feet and were, therefore, considered impractical for the SVCO expansion.

2.0 AFFECTED ENVIRONMENT

Chapter 2 describes the environment that would be affected by the expansion of the Smoky Valley Common Operation (SVCO). Information summarized in this chapter was obtained from published sources; unpublished materials obtained in interviews with local, state, and federal agencies; and from reconnaissance surveys of the project site. The study area varies with different resources. For some resources such as vegetation and soils, the affected area was confined to the immediate "area of concern" of the minesite (Figure 1-5) and the ancillary facilities. For other resources, such as air resources and socioeconomics, a regional study area was delineated and the affected environment was considered in a regional context.

Technical appendices were prepared to support baseline descriptions and impact analyses for soils and cultural resources. These technical appendices are considered appendices to the EA. They are on file at the BLM Tonopah Resource Area Office for public review.

2.1 Air Resources

Baseline meteorology, air quality, and dispersion conditions at the Round Mountain site were estimated from on-site data and data records from the closest monitoring stations in central Nevada (Tonopah and Austin).

2.1.1 Temperature and Precipitation

Table 2.1-1 presents summaries of temperature and precipitation data from the two monitoring stations closest to Round Mountain: Tonopah (46 miles south) and Austin (56 miles north). Both stations are similar in elevation and terrain to the Round Mountain site; thus, data from these stations would be representative for the immediate area. Round Mountain measurements are also shown in the table.

Temperature data indicate relatively wide diurnal and seasonal variability which is typical of dry climates such as Nevada. Warmest temperatures are in late July or early August with coldest temperatures in January. Extremes can range from 105°F in the summer to -15°F in the winter.

TABLE 2.1-1

REGIONAL TEMPERATURE AND PRECIPITATION DATA

Station	Elevation in feet	Years of Record	Period of Record		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Maximum, Minimum, and Mean Temperatures (F°)																	
Tonopah	5,426	33	1936-1968	Max	65	68	77	83	94	102	104	100	96	87	73	70	104
				Min	-15	-7	6	9	18	26	40	31	23	15	2	-13	-15
				Mean	30.1	34.7	39.8	48.7	56.8	63.3	73.9	71.8	64.3	52.9	38.8	33.5	50.7
Round Mountain	6,050	2	1984-1985	Max	54	56	60	74	88	96	94	90	84	78	64	50	96
				Min	4	0	16	18	30	36	52	48	32	20	8	-2	-2
				Mean[1]	29	28	38	46	59	66	73	69	58	49	36	24	47
Austin	6,543	33	1936-1968	Max	65	67	74	80	88	97	102	98	97	86	74	67	102
				Min	-15	-13	-3	3	12	25	38	30	18	13	-5	-7	-15
				Mean	27.2	31.1	35.3	43.3	51.3	59.6	70.0	68.3	60.6	50.1	37.9	32.2	47.2
Mean Monthly Precipitation (Total Inches)																	
Tonopah	5,426	33	1936-1968		0.31	0.37	0.55	0.58	0.47	0.24	0.43	0.33	0.40	0.47	0.45	0.37	5.08
Round Mountain	6,050	2	1984-1985		0.15	0.03	0.70	0.35	0.84	0.03	0.83	0.44	0.96	1.17	1.76	0.77	8.03
Austin	6,543	33	1936-1968		1.06	1.12	1.51	1.49	1.33	1.13	0.56	0.51	0.47	1.07	0.93	1.08	12.12

Data Source: National Climatic Center, Asheville, NC

[1] Due to the limited data availability at this station, the means shown here have been calculated as the average of the monthly maximum and minimum rather than as the average of mean daily temperatures as was done at the other stations.

The data specific to Round Mountain show a maximum temperature of 96°F in June and a minimum temperature of -2°F in December. The on-site data presented here were collected between 1984 and 1985. During these two years, the annual mean temperature at Round Mountain was 47°F. This mean compares closely to those from Tonopah and Austin.

Precipitation in Nevada is relatively sparce, averaging only about 5 to 10 inches annually. Analysis of data collected during 1984 and 1985 at Round Mountain indicates an average amount of just over 8 inches. Monthly variability in precipitation amounts is not substantial. The average for the years indicated at Round Mountain falls between averages at Tonopah and Austin.

2.1.2 Winds

Figure 2.1-1 illustrates a windrose for Tonopah from the period 1973 to 1977. These data indicate that over 50 percent of the winds came from the sectors west-northwest through north, with almost 17 percent from the north sector alone. The data also indicated a secondary maximum from the south of about 8 percent. Average wind speed was 7.7 knots, with 36 percent of the observations in the 7 to 10-knot range. Westerly and southerly winds were generally strongest, averaging over 10 knots, with east and northeast winds the weakest, averaging about 7 knots.

The SVCO is located in complex terrain where winds are likely to be strongly affected by topographic influences. Data collected on-site between 1982 and 1986 suggest that this is true. Frequency distributions of selected months, seen in Table 2.1-2, indicated predominantly north and northwesterly flow in the winter and predominantly southwesterly flow in the summer. Most observations fell in the 3 to 7 or 7 to 12-mile per hour range. Highest mean wind speeds occurred in the afternoon and were associated with synoptic influences. Strongest winds occurred from the south.

2.1.3 Dispersion Conditions

Dispersion conditions at Round Mountain are affected by two parameters: stability and mixing depth. Stability defines the ability of the atmosphere to disperse a given pollutant concentration. Unstable

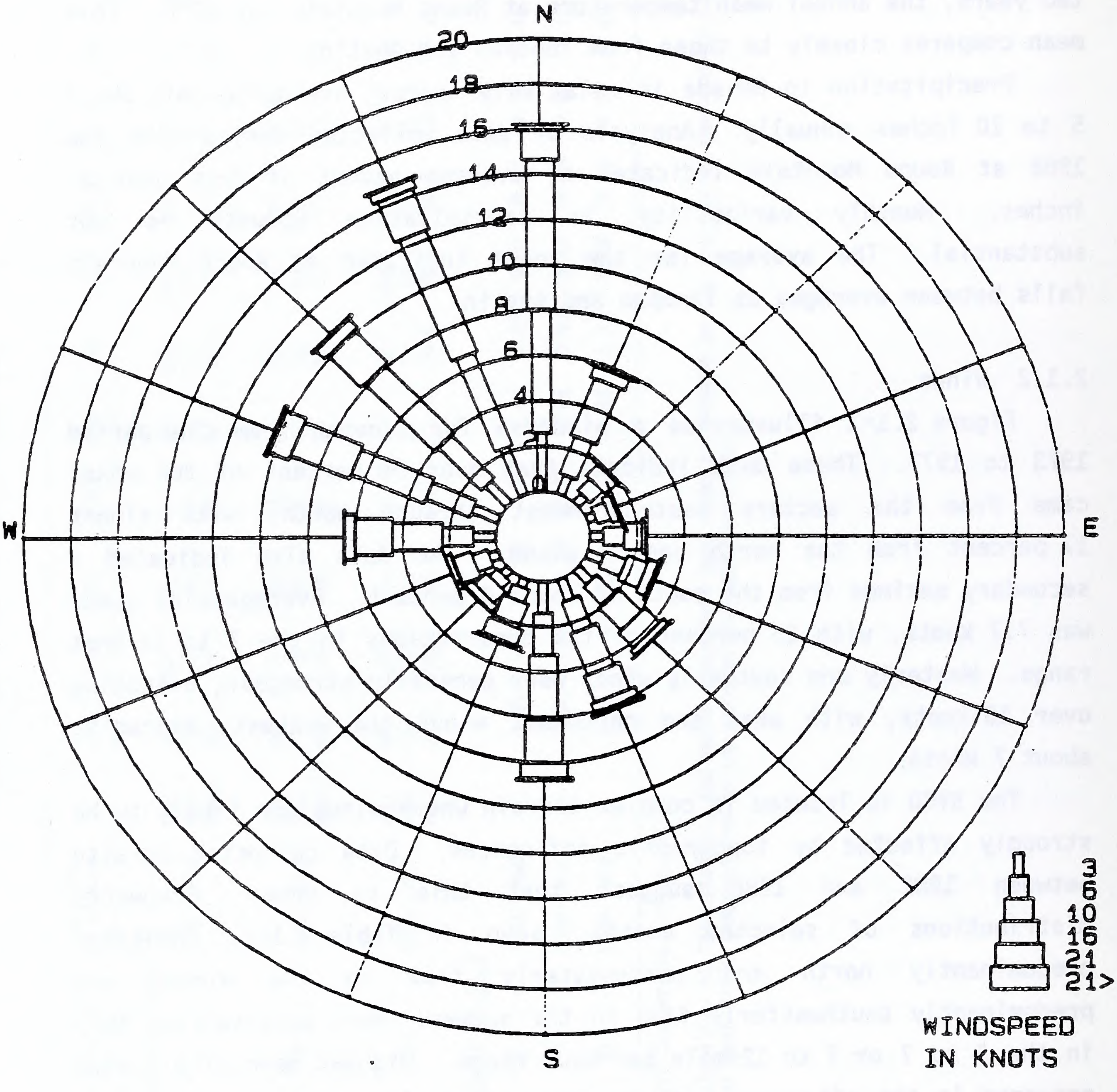


Figure 2.1-1. Star Windrose For Tonopah, Nevada (1973-1977) All Stabilities

Source: ERT 1984

TABLE 2.1-2

WIND SPEED AND DIRECTION
JOINT FREQUENCY DISTRIBUTION (%)
FOR ROUND MOUNTAIN

JANUARY 1984

	ALL HOURS Wind Speed Class[1]						All	Mean Wind
Direction	1	2	3	4	5	6	Speeds	Speed (mph)
N	2.5	7.6	13.8	5.7	1.8	2.6	34.1	11.2
NE	2.9	7.8	8.2	1.0	0.1		20.0	7.4
E	0.5	1.8	2.3	0.2			4.8	7.7
SE	1.5	1.4	2.2				5.4	6.4
S	0.6	1.6	2.6	2.1	1.7	0.2	8.8	12.7
SW	1.6	0.8	2.2	1.1	0.9	1.0	7.6	12.3
W	0.5	0.7	0.5				1.7	5.8
NW	2.0	3.4	7.0	3.8	0.4	1.3	17.9	10.9
All Directions	12.1	25.2	38.8	13.7	4.8	4.9	99.5	10.9
Calm	0.5							

APRIL 1985

	ALL HOURS Wind Speed Class[1]						All	Mean Wind
Direction	1	2	3	4	5	6	Speeds	Speed (mph)
N	1.1	3.2	4.6	1.4	0.8		11.3	9.3
NE	2.1	10.0	6.2	0.7			19.1	6.9
E	0.2	1.3	0.3				1.7	6.2
SE	2.1	7.0	2.1	0.8			12.1	6.3
S	0.1	0.6	2.1	2.4	3.1	0.4	8.8	16.0
SW	1.0	5.6	12.0	4.8			23.4	9.7
W	0.3	0.8	0.6	0.5			2.2	8.5
NW	0.8	7.6	7.9	1.4	0.1	0.1	18.0	8.3
All Directions	7.7	36.2	35.8	12.1	4.1	0.6	96.6	8.7
Calm	3.4							

TABLE 2.1-2 (CONTINUED)

JULY 1985

Direction	ALL HOURS Wind Speed Class[1] 1	2	3	4	5	6	All Speeds	Mean Wind Speed (mph)
N	0.1	2.1	3.4	0.2			5.8	8.4
NE	0.5	11.7	5.5	0.3			18.1	6.9
E		0.4					0.4	5.5
SE	0.4	5.1	2.1	0.7	0.2		8.4	7.8
S	0.2	2.1	4.2	1.6	2.1	0.9	12.2	12.2
SW		7.2	18.3	8.0	0.3		33.8	10.4
W		0.5	0.2				0.6	7.9
NW	0.6	6.6	4.8	0.4	0.5		12.8	8.0
All Directions	1.8	35.7	38.5	12.4	3.0	0.9	92.1	8.7
Calm	7.7							

OCTOBER 1985

Direction	ALL HOURS Wind Speed Class[1] 1	2	3	4	5	6	All Speeds	Mean Wind Speed (mph)
N	0.6	2.9	8.2	0.7			12.3	8.9
NE	1.0	11.2	3.8	0.4			16.5	6.5
E		0.8	0.4				1.2	7.0
SE	0.7	9.5	3.7				14.0	6.5
S	0.5	2.8	9.5	4.6	1.2	0.1	18.5	11.4
SW	0.3	3.1	8.3	3.5			15.1	10.3
W			0.2	0.3			0.4	16.6
NW	0.3	6.6	6.2	0.6			13.7	7.9
All Directions	3.2	36.9	40.4	10.0	1.2	0.1	91.7	8.0
Calm	8.4							

---

[1] Definitions of Wind Speed Classes

Wind Speed Class	Wind Speed (mph)
1	$0 < U \leq 3$
2	$3 < U \leq 7$
3	$7 < U \leq 12$
4	$12 < U \leq 19$
5	$19 < U \leq 24$
6	$24 < U$

conditions represent maximum dispersion while stable conditions represent minimum dispersion. Mixing depth defines the atmospheric volume through which dispersion may take place.

Estimates of atmospheric stability taken from the 1973 to 1977 Tonopah data indicate about 24 percent of the observations are associated with unstable conditions, 35 percent with neutral, and 42 percent with stable. Average wind speeds are highest for neutral conditions and decrease as the stability and/or instability increases. In general, southerly winds are associated with unstable conditions while northerly winds are associated with stable flow. Neutral conditions are often associated with strong westerly winds. Mixing depths are at a maximum during the afternoon and during summer when solar insolation is strongest.

Estimates of atmospheric stability from on-site Round Mountain observations indicate that 32 percent of observations fall under unstable conditions, 43 percent under neutral conditions, and 25 percent under stable conditions. This indicates slightly more favorable atmospheric dispersion when compared with Tonopah observations. As with Tonopah, wind speeds are highest for neutral conditions and decrease as the stability increases or decreases.

2.1.4 Air Quality

Total suspended particulate (TSP) data were collected near the SVCO for approximately six months during the summer of 1986. The TSP sampler was sited approximately 1 mile west of Round Mountain in a location west of the supervisory personnel residential area and south of the waste dumps. The existing ore crushers were approximately half way between the sampler and Round Mountain. The open-pit mine was east of the sampler.

Table 2.1-3 summarizes particulate matter concentrations collected between April 26, 1986 and October 29, 1986 at the Round Mountain site. The maximum value during this period was 185 micrograms/cubic meter (μg/m^3). This exceeds the Nevada state and federal secondary particulate standard of 150 μg/m^3. It does not exceed the federal primary particulate standard of 260 μg/m^3. Table 2.1-4 shows a distribution of the measured particulate values at Round Mountain. High

TABLE 2.1-3

TOTAL SUSPENDED PARTICULATES AT ROUND MOUNTAIN

APRIL 26 - OCTOBER 29, 1986

Sample Date		Sample Period (Hours)	Flow Rate (SCFM)	Mass Loading (g)	TSP Concentration ($\mu g/m^3$)	Comments
April	26	22.8	39.8	0.0223	14	
May	2	24.3	40.0	0.0297	18	
	6	23.6	40.4	0.0191	12[1]	Test run to check Dickson recorder. Very cold.
	8	22.6	40.6	0.0184	12	Short run.
	14	24.8	40.2	0.0540	32	
	20	23.3	40.6	0.1359	85	Filter torn on edge, extremely dirty. Gusty.
	26	23.7	40.7	0.0845	52[1]	Large tear in filter. Windy.
June	1	23.8	40.5	0.0831	50	Some rain.
	7	23.6	40.8	0.1117	68	Small tear on edge of filter.
	13	23.8	40.9	0.2242	135	Filter very dirty.
	19	24.1	40.9	0.0856	51	
	25	24.1	38.8	0.2941	185	Small hole on crease.
July	1	23.3	40.3	0.1264	79	
	7	23.3	40.7	0.0713	44	
	13	23.0	40.5	0.1021	64	
	19	24.1	40.1	0.1274	77	Corner missing, inside filter.
	25	24.0	39.7	0.1541	95	Gusty. Rain - 0.2 inches.
	31	----	----	------	--	Missed sample day, sample run on August 1.
August	1	24.9	40.2	0.2040	120	Dark haze to south, mine dust? Corner torn.
	6	24.1	40.8	0.1214	73	Dark cloud to south.
	12	23.4	38.4	0.1183	78	
	18	24.1	40.5	0.1052	63	
	24	23.9	41.3	0.0765	45	
	30	25.4	41.2	0.2003	112	Small tear on edge of filter.

TABLE 2.1-3 (CONTINUED)

Total Suspended Particulates at Round Mountain
April 26 - October 29, 1986

Sample Date		Sample Period (Hours)	Flow Rate (SCFM)	Mass Loading (g)	TSP Concentration ($\mu g/m^3$)	Comments
Sept	5	24.1	41.2	0.2209	130	Range fire north of site.
	11	23.9	41.2	0.2055	122	Small rip in filter.
	17	23.6	41.3	0.1437	86	Cold.
	23	22.5	42.1	0.0885	54	Small rip on edge of filter.
	29	24.1	42.2	0.0856	49	Cool and windy. Small tear on edge of filter, torn after sample.
Oct	5	23.5	42.2	0.0913	54	
	11	24.3	42.1	0.0702	40	Gusty.
	17	24.6	42.3	0.0483	27[1]	Questionable sample. Dickson chart indicates incomplete run.
	23	26.6	42.0	0.0581	30[1]	Long run, sampled from noon to noon. Rip in filter. Dickson chart indicates lower flow rate.
	29	24.9	42.5	0.0334	18	Tear on edge of filter.

Number of Samples: 33

Highest: 185 $\mu g/m^3$

Second Highest: 135 $\mu g/m^3$

Geometric Mean from 29 Samples: 58.5 $\mu g/m^3$

Nevada Standards: 150 $\mu g/m^3$, 24-hour average, not to be exceeded more than once
75 $\mu g/m^3$, annual geometric mean

[1] Not included in geometric mean

TABLE 2.1-4

DISTRIBUTION OF TSP VALUES MEASURED AT ROUND MOUNTAIN

Range: ($\mu g/m^3$)	10-30	31-50	51-70	71-90	91-110	111-130	131-150	151-170	171-190	Total
	14	32	52	85	95	120	135		185	
	18	50	68	79		112				
	12	44	51	77		130				
	12	45	64	73		122				
	27	49	63	78						
	30	40	54	86						
	18		54							
# Values	7	6	7	6	1	4	1	0	1	33
% Total	21.2	18.2	21.2	18.2	3.0	12.1	3.0	0	3.0	99.9

particulate concentrations are a fairly rare occurrence with only 6 samples (or 18 percent of the measured concentrations) above 100 μg/m^3.

The measured exceedance of the particulate standard occurred on June 25, 1986. On this day, the high temperature was 87°F. The measured wind speed at Round Mountain met or exceeded 20 miles per hour (hourly average) for 6 hours out of the afternoon. Wind speeds this high during the summer are relatively infrequent events, as evidenced by Table 2.1-2, which shows only 5 percent of all observed winds exceeding 20 miles per hour. The wind direction during this time shifted from the north to the north-northeast to the southeast, indicating some contribution to measured particulate levels from the mine.

2.2 Geology and Mineral Resources

2.2.1 Geologic Setting

The Round Mountain mine is located within the basin and range physiographic province. Geologically, this province is characterized by elongated and subparallel erosional remnants of fault block mountain ranges separated by aggraded desert valley plains. The site is situated on the southwest slope of a prominent topographic knob that protrudes from the surrounding pediment on the west flank of the Toquima Range in Big Smoky Valley. The valley is bounded on the west by the Toiyabe Range. Rocks of the Toquima Range include highly deformed and locally metamorphosed lower Paleozoic sediments, which are intruded by Mesozoic and Tertiary igneous rocks and flanked with Tertiary volcanic flows and tuffs from several local centers. The Toiyabe Range consists of deformed lower Paleozoic sedimentary rocks and upper Paleozoic and Mesozoic sedimentary and volcanic rocks, locally metamorphosed by Cretaceous and Tertiary intrusive igneous rocks. Also present are flanking Tertiary volcanic flows and tuffs from local eruption centers and a Quaternary basaltic volcano. Basin valley fill sediments include Tertiary and Quaternary fanglomerate gravels, sands, and silts deposited by streams and slope wash, and sands and silts deposited by wind and lakes. The thickness of these deposits varies from thin veneers on pediment slopes to thousands of feet in the valley centers. The mine itself is underlain by Tertiary volcanic bedrock and surficial deposits of pediment gravels, alluvium, and residual soils that approach several hundred feet in thickness.

2.2.2 Geologic Hazards

Potential geologic hazards include ground shaking and surface liquefaction associated with earthquakes, unstable soils, and mass wasting processes. Evidence of seismic activity in the valley is demonstrated by the recent fault scarps present along the eastern Toiyabe Range front that displace Quaternary to recent sediments. Mapping and exploration drilling at the mine have delineated intense northwest trending ore-related faulting, as well as major northeast trending basin faults. Secondary seismic effects due to liquefaction of saturated sandy soils are limited by the dry climate, deep water table, and generally thin soil cover. Where deeper alluvial soils occur in the basins, seismic liquefaction could occur. Isolated occurrences of expansive clay in residual soils of weathered volcanic bedrock is often overlain by alluvial soils. Hydrocompaction of loess soils are a potential hazard in the region, but most commonly occur leeward (N-NE) of playas and alluvial fans. Landslides on natural slopes are uncommon in the general area. One area of slumping to the south of the mine may merely be an artifact of faulting. The limiting factors are the dry climate, thin upland soils, and general lack of clay soils. Erosion, deposition, rapid changes in stream course, and flash flooding in drainages and on young, active alluvial fans is common.

2.2.3 Mineral Resources

The history of mining in the area is in evidence from the late 19th century. Old districts like Austin, Belmont, and Manhattan date from the 1860s and were staging areas for later discoveries. Gold was discovered at Round Mountain in 1905, and continuous mining progressed into the late 1930s. Discontinuous placer and lode mining took place intermittently during the 1940s and 1950s. Indications of past mining activity include numerous prospects, shafts, adits, and pits in the mine area proper and throughout the surrounding ranges. Present mining in the area includes several medium-sized gold and silver mines from the northern end of the Toiyabe Range to the southern end of the Toquima

Range. Current mining at Round Mountain commenced in the mid-1970s, after a rise in the price of gold made low-grade deposits profitable.

The Round Mountain gold deposit is hosted in hydrothermally altered volcanic tuffs of middle Tertiary age. The mineralization is found in three different tuff units and, to some degree, in underlying Cretaceous granite and Paleozoic metasedimentary rocks. The majority of the economic mineralization occurs in northwest trending fracture-controlled orebodies in the densely welded zone, and in a strataform disseminated orebody in the poorly welded zone of the uppermost tuff unit. The average grade ore contains approximately 0.035 to 0.040 ounces of gold per ton, and 0.015 to 0.020 ounces of silver per ton. Quartz, pyrite, and iron-manganese oxides are associated with the precious metal mineralization. In excess of 200,000,000 tons of ore grade material have been set aside as reserves. Additional future reserves could include extensions of the identified orebodies, low-grade ore deposited as waste rock, and other as yet undiscovered orebodies in the area.

2.3 Water Resources

2.3.1 Groundwater

Regional. The Big Smoky Valley includes an area of about 3,000 square miles and comprises two hydrographic areas: the northern part and the southern part (Tonopah Flat). The project site is situated in the northern part of the valley, which is a topographically-closed basin (no external surface water inflow or outflow) about 1,400 square miles in area. The water resources of the Big Smoky Valley have been described in detail by Rush and Schroer (1971), and the following discussion is based on that publication.

The northern part of the Big Smoky Valley is bounded by mountain ranges composed of granitic, volcanic, and sedimentary rocks which form summits up to 12,000 feet in elevation. An alluvial apron extends from the rock contact (elevation 6,200 to 6,600 feet) down to large playas (dry lake beds) on the valley floor at elevations of 5,500 to 5,800 feet. The alluvial deposits consist of semiconsolidated to unconsolidated lenses of gravel, sand, silt, and clay underlying alluvial fans, slope wash areas, and upland alluvial surfaces. The playa deposits are composed of silt, clay, and evaporites.

The 3,000 to 5,000-foot thick alluvial deposits form the regional aquifer, termed the valley fill aquifer. Groundwater in this aquifer occurs between intergranular pores of the alluvial materials. The aquifer is recharged from precipitation on adjacent mountains (up to 20 inches/year) and on the valley floor (about 6 inches/year). Recharge reaches the aquifer primarily from percolation of stream flow at the bedrock/alluvium contact, with minor recharge from precipitation which percolates through bedrock fractures and flows upward into the alluvium beneath the valley floor.

The groundwater recharge to the northern part of the Big Smoky Valley has been estimated at 65,000 acre-feet per year. Groundwater in the valley fill reservoir flows from recharge areas (bedrock/alluvium contact) to discharge as springs in the central valley floor, through soil evaporation on the playas, and as transpiration by phreatophytes (deep-rooting plants). Depths to groundwater range from greater then 100 feet near the valley fill margins to 0 to 15 feet beneath the central valley floor, where springs and flowing wells occur.

The transmissivity of an aquifer is a measure of the capacity of the aquifer to transmit groundwater through its entire saturated thickness. Transmissivities of the valley fill aquifer in the northern part of the Big Smoky Valley have been estimated at 30,000 to 40,000 gallons per day per foot (gpd/ft), based on a limited amount of pumping test data from area wells. An area of high transmissivity (greater than 50,000 gpd/ft) is evident in the southwest corner of the valley (west of Round Mountain), based on the presence of high-capacity wells in this vicinity.

Well yields reported for the northern Big Smoky Valley range from about 100 to 3,900 gallons per minute (gpm), with most high capacity irrigation or industrial wells showing yields of over 1,000 gpm. The highest well yields were reported in the southwest corner of the valley, west of Round Mountain.

Regional groundwater quality data reported by Rush and Schroer (1971) are based on water samples collected in 1952, 1954, and 1968. Groundwater for the aquifer in the northern part of the Big Smoky Valley is generally of suitable quality for drinking water, irrigation, and industrial purposes, except for shallow wells in playa areas where salts have concentrated from evaporation. General groundwater characteristics include slightly alkaline pH and low dissolved solids (as indicated by low specific conductance).

Local. Water supply for the Round Mountain townsite and the mining operations was originally piped from creeks on the east and west sides of the valley, which is about 7 miles wide in the vicinity of Round Mountain. A 15-inch diameter riveted steel pipeline was completed in 1915 from Jett Creek on the west side of the valley to Round Mountain (Glover 1977). The surface water supplies were supplemented with groundwater from wells, especially during summer periods of little or no flow in the creeks.

Currently, both groundwater and surface water are utilized by the Round Mountain townsite and the SVCO. Groundwater for the town is obtained from wells operated by the Shoshone Water Company while the SVCO mine facilities utilize two wells to supplement the Jett Creek surface water source. Recorded wells in the vicinity of Round Mountain and the SVCO are shown on Figure 1-9, and well information is summarized in Table 2.3-1.

As indicated in Table 2.3-1, well depths in the vicinity of the SVCO vary from 238 to 592 feet, with reported static (non-pumping) depths to water ranging from 50 to 100 feet below land surface. Well yields range from 900 to 1,000 gpm. Specific capacities (yield divided by water-level drawdown associated with that yield) vary from about 6 to 63 gallons per minute per foot (gpm/ft) of drawdown. Current groundwater pumpage is estimated at 2,300 gpm peak flow (800 gpm non-peak flow) from the two mine wells.

Water-level data from production wells and observation wells in the immediate vicinity of the SVCO were compiled by Sergent, Hauskins & Beckwith (1982). These data indicate horizontal groundwater movement from the east (minesite and Round Mountain area) and the west areas of higher topographic elevation toward Highway 376 on the valley floor. A northerly flow component is evident along the valley floor toward the playa near the center of the valley. Based on extrapolation of these

TABLE 2.3-1

INFORMATION SUMMARY FOR WATER WELLS IN THE VICINITY OF THE SVCO EXPANSION

Owner	Location(1)	Year Drilled	Depth(ft)	Yield (gpm)	Static Water Level(ft)	Drawdown (ft)	Use	Reference
Round Mtn. Gold Corp.(2)	10/43-20aa	1948	592	1,800	105	34	Mining	(3)
Round Mtn. Gold Corp.(2)	10/43-20aa	1952	372	2,000	98	32	Mining	(3)
Round Mtn. Gold Corp.(2)	10/43-22bd	1948(?)	238	---	41	---	Mining/Not Used	(3)
---	10/43-22bd	---	66	---	45	---	Not Used	(3)
---	10/43-22cc	---	---	---	58	---	Stock/Domestic	(3)
Frank Arcelius	10/43-28cc	1963	485	3,900	130	37	Irrigation	(3)
---	10/44-20bb	1948	307	900	40	150	Public Supply(?)	(3)
Round Mtn. Gold Corp.	10/44-20ba	1986	515(5)	70	108	280	Public Supply	(4)
Round Mtn. Gold Corp.	10/44-20ba	1986	515(6)	100	110	274	Public Supply	(4)

Notes
(1) Format: Township/Range - Section, Quarter Section; a=NE¼, b=NW¼, c=SW¼, d=SE¼
(2) Listed in reference as Ordrich Gold Reserves Co.
(3) Rush and Schroer 1971
(4) Nevada Division of Water Resources 1987
(5) "Water Well #2;" completed in volcanic bedrock
(6) "Water Well #3;" completed in volcanic bedrock

water-level data, depth to groundwater in the vicinity of the proposed leach residue disposal area west of the current mining operation probably ranges from 155 to 230 feet (Sergent, Hauskins, & Beckwith 1982).

Groundwater quality data for wells tapping the valley fill aquifer in the project area are shown on Table 2.3-2. These chemical data indicate that groundwater obtained locally from this aquifer is suitable for potable supply and industrial use. This water is slightly alkaline and is generally low in dissolved solids, although the Round Mountain town well showed higher concentrations of dissolved constituents. Variations in groundwater quality with well depth and well location in the valley can be expected.

2.3.2 Surface Water

The streams in the general vicinity of the SVCO are classified as ephemeral and flow only in direct response to precipitation events and snowmelt runoff. Streams from the Toiyabe Range west of the project area generally flow onto alluvial fans with their maximum flow at the mouth of the canyons; the flows decrease downstream on the alluvial fans (Rush and Schroer 1971). Streams from the Toquima Range in the vicinity of the minesite have not developed alluvial fans.

Average annual precipitation ranges from 6 inches or less on the valley floor to over 20 inches in the mountains, most of which accumulates as snow during the winter. Thunderstorm rainfall amounts are low relative to most thunderstorm-prone areas in the United States, with an estimated 100-year, 6-hour rainfall event of only 2.3 inches (Table 2.3-3).

Rainfall runoff for various storm events for Jett and Pablo Creeks was evaluated using the U.S. Soil Conservation Service TR-20 hydrology program to quantify the potential for flash flooding in the project area (Table 2.3-4). A range of flows for each recurrence interval was developed because of the variability of climatic and soil conditions. These two creeks flow nearest to the proposed village and have the greatest flood potential. During normal runoff conditions there will be little or no surface flow near the proposed village. During major high

TABLE 2.3-2

GROUNDWATER QUALITY DATA

Well Designation[1] Date Sampled Well Location	CR-1 2-19-86 10/44-28	CR-2 2-20-86 10/44-28	RM-1 8-5-86 10/44-20
Chemical Analyses			
pH	7.9	7.9	7.8
Total Dissolved Solids, mg/L	218	227	457
Sulfate, mg/L	46	46	90
Chloride, mg/L	6	7	65
Nitrate, mg/L	1.5	1.5	38
Fluoride, mg/L	0.1	0.1	0.5
Calcium, mg/L	37	37	74
Sodium, mg/L	20	20	47
Potassium, mg/L	2.5	2.5	5.0
Magnesium, mg/L	8.7	8.7	10.2
Bicarbonate Alkalinity, mg/L as $CaCO_3$	130	131	126

Source: Round Mountain Gold Corporation 1987.

[1] CR=Christensen Ranch
RM=Round Mountain Town Well

TABLE 2.3-3

RAINFALL ESTIMATES FOR THE JETT CREEK AND PABLO CREEK WATERSHEDS IN THE TOIYABE RANGE

Storm Recurrence Interval (Years)	Total Storm Point 6-Hour Duration	Rainfall (Inches) 24-Hour Duration
2	1.1	1.7
5	1.4	2.1
10	1.6	2.4
25	1.9	2.9
100	2.3	3.6

Note: Rainfall estimates for the 2-year through 100-year storms were taken from National Oceanic and Atmospheric Administration Atlas for Nevada (NOAA 1973).

TABLE 2.3-4

RAINFALL RUNOFF HYDROGRAPH SUMMARY FOR A 1-HOUR STORM

Storm Recurrence Interval (Years)	Jett Creek		Pablo Creek	
	Peak Flow (cfs)	Volume (acre-feet)	Peak Flow (cfs)	Volume (acre-feet)
2	0-40	0-30	0-60	0-40
5	20-140	20-70	30-190	20-100
10	100-260	50-110	120-340	70-160
25	160-540	80-190	210-680	120-280
100	210-1,000	110-330	560-1,300	260-490

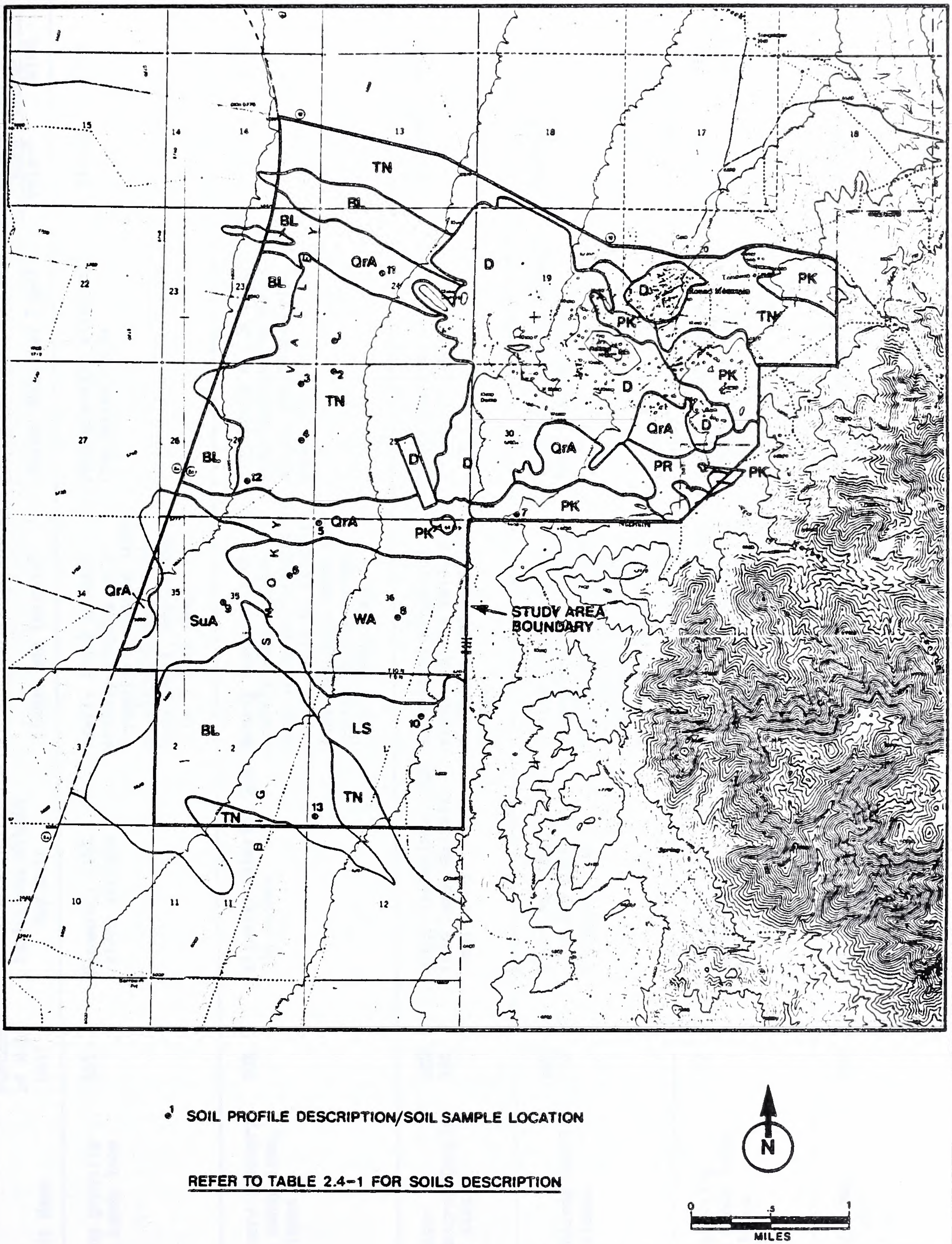
intensity storms, flow can be expected in the creeks. Typically, the peak flow for a 1-hour storm will occur 3 to 5 hours after the storm begins. Maximum stream flow velocities are expected to be on the order of 5 to 8 feet/second which may cause some bank erosion. Major lateral movement of the stream channels can be expected on the alluvial fans when the present channel is blocked by debris or sediment deposition. Overbank flow on the lower portion of the fan is only expected for the higher recurrence interval storms and should be of short duration.

Runoff from the project site and small drainages to the east is limited to short periods after high intensity storms or rapid snow melt. Most drainages to the east of the minesite are low, less than 8,000 feet in elevation, with average annual precipitation at the site of less than 6 inches per year. An evaluation of surface water yield was undertaken of the drainage basins directly to the east of the minesite where surface runoff from these basins would affect the minesite. Average annual runoff was estimated using a method developed by Riggs and Moore (1965). The largest drainage basin is Kelsey Canyon which has an estimated mean annual runoff of about 0.5 cfs. All other basins have a mean annual runoff of less than 0.1 cfs.

2.4 Soils

Detailed soil mapping and sampling for the proposed expansion of the SVCO at Round Mountain were conducted by ERT soils personnel in late March 1987. The results of this field work are summarized in this document. The soils map of the project area is presented as Figure 2.4-1; Table 2.4-1 summarizes the soil map unit characteristics. More information on the soils of the study area is included in the Soils Technical Appendix.

The Round Mountain study area lies in the Great Basin section of the basin and range province (Peterson 1981). The region is characterized by broad, alluvium-filled basins bounded by steep mountain ranges. Smaller, isolated mountains and hills are not uncommon. Extrusive igneous bedrock is dominant, with hydrothermally altered zones and sedimentary rocks occurring in some areas. This geologic pattern generally results in shallow rocky soils on steep ridge crests. Progressively deeper, coarse-textured, and sorted soil materials occur



• SOIL PROFILE DESCRIPTION/SOIL SAMPLE LOCATION

REFER TO TABLE 2.4-1 FOR SOILS DESCRIPTION

SMOKY VALLEY
COMMON OPERATION EXPANSION

Figure 2.4-1. Soil Map

TABLE 2.4-1

SOIL MAP UNIT CHARACTERISTICS

Map Unit Number	Map Unit Name	Percent of Map Unit	Inclusions Within Map Unit	Slopes and Terrain[1]	Parent Material Type[2]	Erosion Hazard of Bare Surface		Range Site[4]
						Water[3]	Wind	
BL	Bluewing gravelly coarse sandy loam	85%	Bluewing, 15% stony surface	Nearly level to moderately sloping very irregularly shaped areas on alluvial fans that have small, dry washes 1 to 4 feet deep.	Very gravelly alluvium from mixed rocks	Slight	High	Desert Loamy
LS	Laxal very channery coarse sandy loam, 0-8% slopes	90%	alluvial material 10% in washes	Nearly level to moderately sloping very deep soils on irregularly shaped areas on alluvial fans that have been dissected by dry washes 1 to 4 feet deep	Very shaly alluvium derived from interbedded micaceous shale, limestones and quartzite	Slight	High	Desert Loamy
PK	Pintwater- Rock Outcrop Complex 15-50% slopes	50% 30%	minor inclusions 20% (Old Camp, Malpais, and Roic)	Moderately steep and steep shallow soils on foothills and mountain slopes	Colluvium from volcanic rhyolitic rocks	Moderate	High	Semidesert Shallow Loamy
PR	Pumel- Rock Outcrop Complex 4-50% slopes	60% 25%	Bluewing 10% (in dry washes) Pintwater 5%	Gently sloping to strongly sloping very shallow soils and rock outcrop on rounded, undulating to rolling hills and pediments	Colluvium derived mainly from granodiorite	Moderate	High	Semidesert Shallow Loamy
QrA	Quima gravelly coarse sandy loam, 0-4% slopes	85%	Bluewing 5% Koyen 5% Stumble 5%	Nearly level to gently sloping very deep soils on large, broad, smooth to undulating areas on alluvial fans	Alluvium derived from granite, rhyolite, tuff, and ash	Slight	High-Very High	Desert Loamy
SuA	Stumble loamy coarse sand, 0-2% slopes	85%	Bluewing 10% Quima 5%	Nearly level very deep soils on alluvial fans and sand sheets	Alluvium from mixed rock sources	Slight	High	Desert Sand

TABLE 2.4-1 (CONTINUED)

Map Unit Number	Map Unit Name	Percent of Map Unit	Inclusions Within Map Unit	Slopes and Terrain[1]	Parent Material Type[2]	Erosion Hazard of Bare Surface		Range Site[4]
						Water[3]	Wind	
TN	Timper- Noyson gravelly coarse sandy loams Complex 0-8% slopes	50% 40%	Bluewing 10%	Nearly level to gently sloping soils that are shallow (Timper 12 to 20") and moderately deep (Noyson 20 to 36") to a strongly cemented hardpan. They are an alluvial fans.	Alluvium mostly from mixed volcanic rocks	Slight	Very High	Desert Loamy Sal
WA	Wardenot gravelly coarse sandy loam, 0-8% slopes	85%	Bluewing 10% Quima 5%	Nearly level to moderately sloping very deep soils on alluvial fans	Alluvium from mixed rocks	Slight	High	Desert Loamy
D	Disturbed area (without topsoil)							

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[1] Terminology from USDA-SCS. June 1981.

[2] Terminology from USDA-SCS. June 1981.

[3] Erosion hazard class taken from SCS Official Soil Series Descriptions for water erosion hazard, and the National Soils Handbook (SCS 1983) for wind erosion hazard.

[4] Range site taken from the SCS Soil Survey of Big Smoky Valley, Part of Nye County (Candland 1980).

downward from the colluvial sideslopes to the alluvial fans and fan aprons.

On the project area itself, the mountain slopes and hills are dominated by rock outcrops and the Pintwater soil. It is shallow, well drained, and formed in residuum and colluvium from rhyolite, tuff, and related volcanic rocks. The Pumel soil is also present in the uplands east of the current pit and waste rock disposal area. It is very shallow and formed in residuum and colluvium from weathered granodiorite.

Alluvial fans occur throughout the study area in various forms and positions. In both the new leach pad area and the proposed leach residue disposal area, a complex of two soils occurs, the Timper-Noyson Complex. Both have a strongly cemented hardpan at 12 to 20 inches (Timper) and 20 to 36 inches (Noyson). The soil material above the hardpan is loamy coarse sand and coarse sandy loam with up to 20 percent gravels.

In areas such as the proposed waste rock dump south of the current mine area, other soils occur on alluvial fan positions. The Wardenot, Quima, and Laxal soils are all very deep, calcareous, and have loamy coarse sand and coarse sandy loam textures. Quima has up to 35 percent gravels, and Wardenot has slightly more. Laxal can have up to 60 or 70 percent gravels and channers in lower parts of the soil profile.

The Stumble soil is found on small aeolian deposits on alluvial fan aprons on the west side of the project area. It is a very deep soil that is calcareous with loamy coarse sand texture and up to 20 percent gravel content.

The Bluewing soil occupies ephemeral stream channels throughout the study area and a broad alluvial fan in the southern portion of the project area. These are very deep, very gravelly to extremely gravelly loamy coarse sands.

Existing erosion on the site is evidenced by gravelly, sinuous scour channels and several gullies. Wind erosion also occurs.

Soil suitability evaluations indicate that some native soil materials are suitable for salvage (see Section 3.4). These materials include the upper portions of the Timper, Noyson, Quima, Wardenot, Laxal, and Stumble soils. They are characterized by coarse textures and low amounts of soluble salts. In general, the remaining soils in the area are too shallow, rocky, salty, or a combination of these factors, to be recommended for salvage.

2.5 Vegetation

Vegetation information for the proposed expansion of the SVCO at Round Mountain was obtained from literature, agency contacts, and from field surveys conducted by ERT. ERT field studies are summarized below. Field surveys were used to determine estimates of vegetative cover and composition and to search for rare plant species within the study area. Table 2.5-1 lists the plant species observed during the field surveys. There are no wetlands within the study area.

2.5.1 Vegetation Communities

Five vegetation communities occur within the study area. These include shadscale, greasewood, black sagebrush, fourwing saltbush, and rabbitbrush (Figure 2.5-1). Table 2.5-2 includes a summary of each vegetation type; its relative extent; and average values for cover, shrub density, shrub height, and annual production. The majority of these data were collected by ERT during a March 1987 field study. Each of the vegetation types is described briefly below:

- Shadscale. The shadscale vegetation type is the most extensive community within the study area. This type primarily occupies the level to gently sloping broad alluvial fans. Dominant shrub species include shadscale and bud sagebrush. Less common associated shrub species include Bailey greasewood, Nevada ephedra, spiny hopsage, rabbitbrush, and fourwing saltbush. The grass-dominated understory contains bottlebrush squirreltail, galleta, Indian ricegrass, and bluegrass.

- Greasewood. The greasewood vegetation type occurs on level to gently sloping alluvial fans. Major areas of this type occur in the central portion of the study area (southwest of Round Mountain). This type is characterized by the dominance of Bailey greasewood with associated shrub species including bud sagebrush and shadscale. Less common shrub species are Nevada ephedra, rabbitbrush, and fourwing saltbush. Common understory species include bottlebrush squirreltail, galleta, Indian ricegrass, bluegrass, and buckwheat.

- Black Sagebrush. The black sagebrush vegetation type is found along the higher elevation ridge tops, on low hills, and on steep (up to 60 percent) mountain sideslopes. These areas are

TABLE 2.5-1

PLANT SPECIES OBSERVED WITHIN THE SVCO PROJECT AREA

Common Name	Scientific Name	Community[1]					
		Sh	G	S	F	R	D
Bailey greasewood	*Sarcobatus baileyii*	X	X	X	X	X	
Big sagebrush	*Artemisia tridentata*					X	
Black sagebrush	*Artemisia arbuscula nova*			X		X	
Bluegrass	*Poa secunda*	X	X	X			
Bottlebrush squirreltail	*Sitanion hystrix*	X	X	X		X	
Buckwheat	*Eriogonum inflatum*	X	X		X		
Bud sagebrush	*Artemisia spinescens*	X	X		X	X	
Fourwing saltbush	*Atriplex canescens*	X	X		X	X	
Galleta	*Hilaria jamesii*	X	X	X			
Halogeton	*Halogeton* sp.						X
Indian ricegrass	*Oryzopsis hymenoides*	X	X	X	X		
Littleleaf horsebrush	*Tetradymia glabrata*	X			X	X	
Nevada ephedra	*Ephedra nevadensis*	X	X	X	X	X	
Pricklypear	*Opuntia* sp.	X			X		
Princesplume	*Stanleya* sp.	X	X			X	
Rubber rabbitbrush	*Chrysothamnus nauseosus*			X		X	
Russian thistle	*Salsola kali*						X
Shadscale	*Atriplex confertifolia*	X	X	X		X	X
Spiny hopsage	*Grayia spinosa*	X		X	X	X	
Stickyleaf low rabbitbrush	*Chrysothamnus viscidiflorus*	X	X	X	X	X	X
Willow	*Salix* sp.	X				X	
Winterfat	*Ceratoides lanata*	X	X		X		

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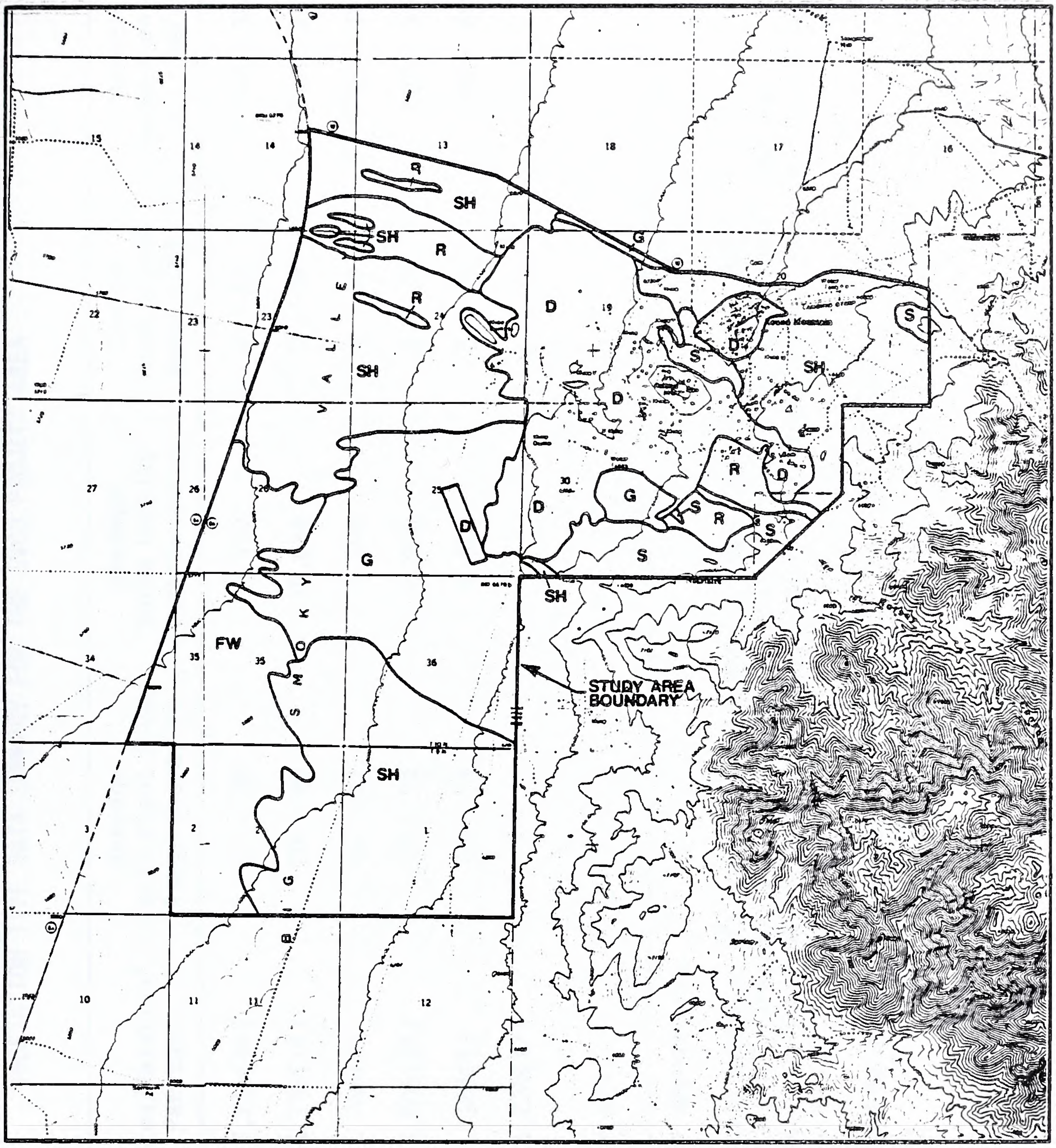
[1] Sh = Shadscale, G = Greasewood, S = Black Sagebrush, F = Fourwing Saltbush, R = Rabbitbrush, D = Disturbed



VEGETATION TYPES

FW—FOURWING SALTBUSH

G—GREASEWOOD

R—RABBITBRUSH

S—BLACK SAGEBRUSH

SH—SHADSCALE

D—DISTURBED/DEVELOPED AREA

N

0 .5 1

MILES

SMOKY VALLEY COMMON OPERATION EXPANSION

Figure 2.5-1. Vegetation Map

TABLE 2.5-2

VEGETATION TYPE DATA SUMMARY FOR THE SVCO PROJECT AREA

Vegetation Type	Acres/Relative[1] Percent	Average Total Plant Cover Range (percent)	Average Shrub Density (shrubs/acre)	Average Shrub Height Range (cm)	Annual[2] Production (lbs air-dry/acre)
Shadscale	3,215(44)	17 - 30	9,108	8 - 60	200 - 300
Greasewood	1,186(16)	20 - 40	10,626	8 - 45	200 - 350
Black sagebrush	268(4)	23 - 33	9,108	8 - 60	200 - 400
Fourwing saltbush	1,008(14)	17 - 30	5,060	15 - 60	300 - 400
Rabbitbrush	363(5)	27 - 33	5,060	8 - 60	100 - 500
Disturbed[3]	1,270(17)	-	-	-	-
TOTAL	7,310				

[1] Acreage calculations are approximate.

[2] Potential production levels based on SCS range site information (SCS 1980; Metscher 1987): Shadscale - Loamy (5-8 inches); Greasewood - Sodic Terrace (3-12 inches); Black sagebrush - Shallow Calcareous Loamy and Shallow Calcareous Hill (8-12 inches); Fourwing Saltbush - Sandy Loam (5-8 inches); Rabbitbrush - Wash (5-8 inches).

[3] Includes approximate Round Mountain townsite area.

concentrated south and east of Round Mountain. This community is characterized by the dominance of black sagebrush with scattered occurrences of shadscale, Bailey greasewood, Nevada ephedra, rabbitbrush, and spiny hopsage. Common understory species are bottlebrush squirreltail, galleta, and bluegrass.

- Fourwing Saltbush. The fourwing saltbush community generally occurs on the level to slightly sloping alluvial fans in the southwestern portion of the study area. Fourwing saltbush, bud sagebrush, and rabbitbrush clearly dominate this vegetation type with associated shrub species including spiny hopsage, winterfat, littleleaf horsebrush, Nevada ephedra, and pricklypear. The sparse understory contains Indian ricegrass and buckwheat.

- Rabbitbrush. This vegetation type is found on the nearly level, sandy drainage areas in the northern portion of the study area. The rabbitbrush community northwest of Round Mountain is characterized by the dominance of rubber rabbitbrush, stickyleaf low rabbitbrush, and bottlebrush squirreltail. Small isolated pockets of big sagebrush occur in this area. The rabbitbrush community southeast of Round Mountain (below Kelsey Canyon) contains a wide variety of shrubs including spiny hopsage, Bailey greasewood, shadscale, bud sagebrush, littleleaf horsebrush, fourwing saltbush, and Nevada ephedra. The understory is sparsely vegetated, at best. This community has been identified as a rabbitbrush community due to the subtle dominance of rabbitbrush above the associated shrub species.

- Disturbed. Some disturbed areas within the study area (i.e., roadsides, older mine spoil pits) display natural reinvasion by a limited number of species. This generally sparse cover commonly includes halogeton, Russian thistle, shadscale, and rabbitbrush. The majority of the disturbed areas identified in Figure 2.5-1 are associated with active mining operations.

2.5.2 Threatened and Endangered Plants

No plants officially listed by the U.S. Fish and Wildlife Service or the State of Nevada are known to occur within the study area and vicinity of Round Mountain based on information provided by the Nevada State Museum and BLM Tonopah Resource Area. The BLM specialists in Tonopah identified two federal Category 2 candidate species (Eastwood milkweed, Asclepias eastwoodiana; and Pahute green gentian, Frasera pahutensis) that potentially could occur in the plant communities within the vicinity of Round Mountain.

Field surveys of the study area were completed to determine the presence of sensitive plant species. Potential habitat areas were the focus of these surveys. Habitat for Pahute green gentian is the pinon-juniper community which occurs outside the study area above 7,000 feet elevation. The habitat for Eastwood milkweed includes the shadscale and greasewood communities common to the study area. These communities, particularly along low hills and drainages, were surveyed in conjunction with vegetation sampling and mapping. No federal or state listed or federal candidate plant species were observed within the study area during the vegetation field program.

2.6 Wildlife

Wildlife information for the SVCO was gathered from available publications, file data, and interviews with personnel of the Nevada Department of Wildlife, Bureau of Land Management, U.S Fish and Wildlife Service, and other appropriate organizations. Site-specific studies were conducted during April 1987 to inventory mammals, songbirds, raptors, and reptiles at the project site.

As described in the vegetation section, the affected environment consists of plant communities and wildlife habitat characteristic of the cold Great Basin desert. Typical wildlife habitat in the affected area can be described as open stands of low and dwarf shrubs. The value of the habitat is limited by its structural and compositional homogeneity. Shoshone Creek, to the north of the affected area, and a small surface drainage from the mine provide limited surface water. East of the mine along the western slope of the Toquima Range, the topography becomes steeper, and stands of big sagebrush gradate into pinon and juniper woodlands. This vegetation, along with occasional rock outcrops and the riparian vegetation of willows and narrow-leafed cottonwoods along upper Shoshone Creek, are important to the area's wildlife diversity and necessary to the survival of some species.

Typical species of the affected area include mammals such as the black-tailed jackrabbit, badger, and coyote, (signs of kit fox were also observed during the early spring site visit); raptorial birds such as the turkey vulture, raven, prairie falcon, and kestrel; songbirds including the horned lark, black-throated sparrow, and rock wren; and reptiles such as the sagebrush lizard and short-horned lizard. Small mammals observed on the site include the little pocket mouse, southern grasshopper mouse, Ord's kangaroo rat, deer mouse, and antelope ground squirrel. Small mammal abundance and diversity were low. The Great Basin, in general, has characteristically high small mammal populations and high diversity. The disturbed nature of the site, in conjunction with the influence of cattle grazing and the April sampling period, may account for these results.

Songbird abundance and diversity were also low at the time of the survey, however, both increase in late spring and summer. A record of sightings at Barker Creek, 7 miles north of Round Mountain, is included in the Appendix.

Except for occasional use by mule deer during the winter or early spring, the site is not used as big game range. Mule deer yearlong range occurs in and adjacent to the Toquima Range of the Toiyabe National Forest east of the project and across the Big Smoky Valley in the Toiyabe Range. Nevada Department of Wildlife data from aerial surveys conducted in these areas show a count of approximately 8,234 deer in Management Area 16. Approximately 20 percent of this number occur in the Toquima Range (Lusk 1987, personal communication).

The project area is classified as potential pronghorn (antelope) range (Tsukamoto 1983). There is a resident pronghorn population in the northern portion of the Big Smoky Valley near Highway 50, about 40 miles north of the project, and a small population in the lower end of the valley about 20 miles south of the project. Desert bighorn sheep were introduced to the Toquima Range on Mount Jefferson about 8 miles northeast of the mine. This population is apparently doing well and expanding (Lusk 1987, personal communication). Bighorn sheep are not expected to use mine habitats.

The chukar is probably the most important gamebird in the project region. It is an exotic gamebird first introduced to Nevada in 1935 (Christiansen 1970). The project area is classified as chukar range. Sage grouse are also known from the general project vicinity (Lusk 1987, personal communication). The sagebrush habitat occurs along the sides of the valley, above the desert shrubs of greasewood and shadscale, intermixing with the pinon - juniper woodlands. No sage grouse or sage grouse sign were observed in examinations of the sagebrush habitat. Sage grouse, and possibly blue grouse, may use the streamside habitats for brood rearing at higher elevations above the mine.

Raptor nest searches did not identify any nests on or near the site. In addition, suitable habitat for raptor nesting does not occur in or within a mile of the affected area. No known active or historic nests occur in the project area (Haley 1987, personal communication; Grover 1987, personal communication). The project site is used for raptor foraging. The raven is common in the area. During the site visit, the turkey vulture, prairie falcon, red-tailed hawk, rough-legged hawk, and kestrel were observed.

Waterfowl were not observed in the area but are known to migrate through the Big Smoky Valley. The lakes near Carver's and other water bodies may attract waterfowl during migration.

No threatened or endangered species of wildlife are known from or likely to occur in the area potentially affected by the project.

2.7 Land Use and Recreation

2.7.1 Land Use

Nye County encompasses 18,064 square miles. Almost 95 percent of the county's 18,064-square-mile land area is administered by the federal government, including BLM lands (10,555 square miles), portions of the Toiyabe and Humboldt National Forests (2,742 square miles), and U.S. Department of Energy test sites (3,593 square miles). Less than 0.1 percent of the county is state-owned, leaving slightly over 5 percent in private ownership. Ownership in the Round Mountain vicinity is similar to the county as a whole with a somewhat higher percentage of private land clustered near water sources such as wells and springs. Figure 2.7-1 illustrates land ownership in the vicinity. Both the Toiyabe Range on the western flank of the Big Smoky Valley and the Toquima Range to the east are elements of the Toiyabe National Forest. The valley floor is public land managed by the BLM except for the private holdings.

Land uses in Nye County include range and grazing lands, agricultural lands, wildlife habitat, recreation in national forests, government withdrawals (Indian colonies and test sites), mining, and small rural communities.

Land use in the project vicinity is dominated by open space and grazing uses. The existing SVCO mining activity is the most intensive

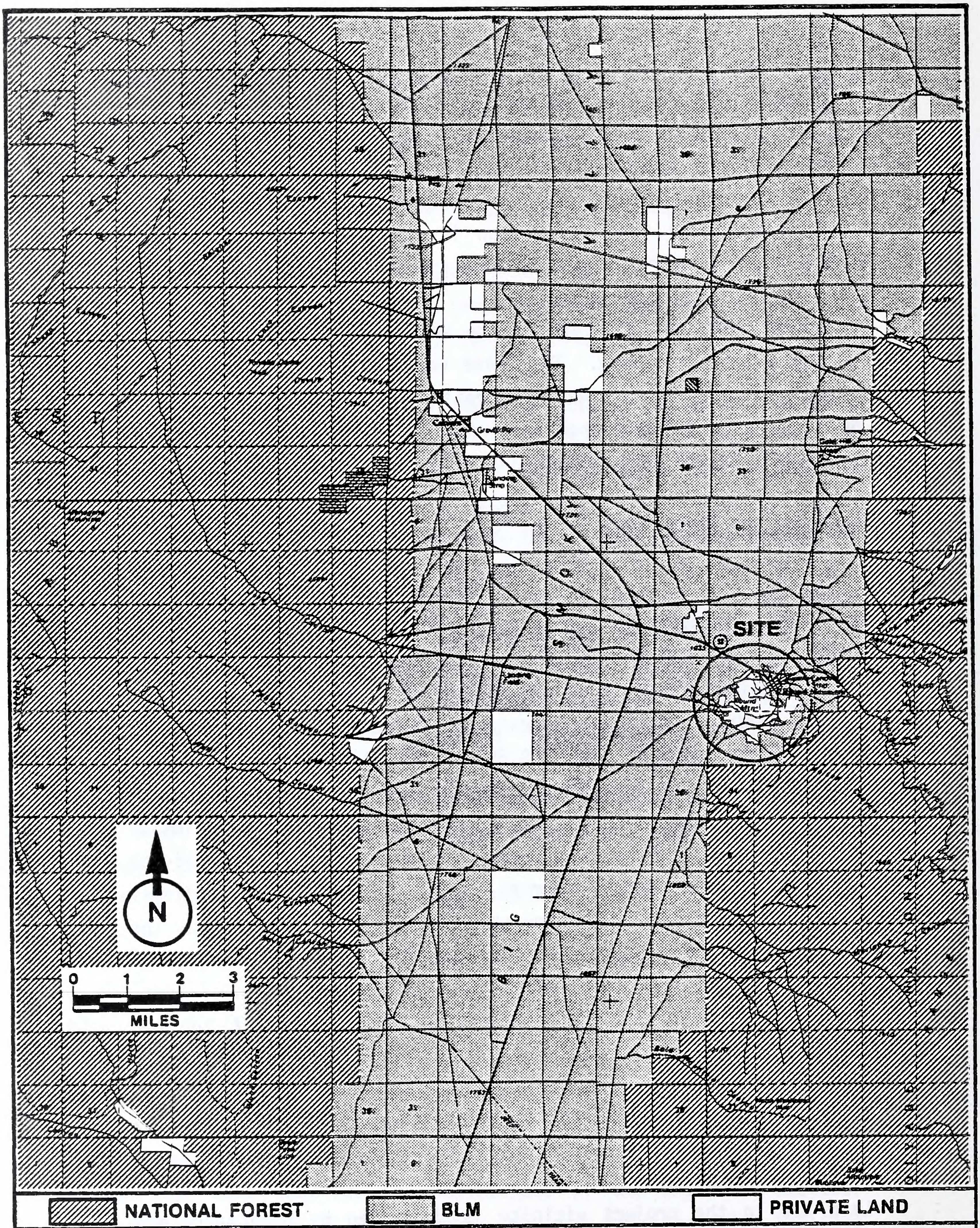


Figure 2.7-1. Land Ownership Map

use of land in the area. The small community of Round Mountain, adjacent to the SVCO, is largely residential in nature with supporting convenience commercial and public facilities.

Grazing on range allotments is the highest economic use of most federal lands in the Big Smoky Valley. Intensive agriculture is limited by low precipitation and a shortage of irrigation water. There is no intensively cultivated, irrigated cropland in the immediate vicinity of the proposed project, although there are some hay meadows farther north and to the southwest in the valley. No land considered prime or unique farmland occurs in the project area.

A land use plan is considered the basic element of the 1970 Nye County General Plan, which was updated in 1978 and is still in effect. A few key elements in the 1978 Nye County Land Use Plan are:

- Current and past uses of the land resources should be a guide for the development of future planning elements.
- The concept of multiple use should be the overriding policy in planning for federally controlled lands.
- The mining and agricultural uses of lands are strongly held as a best use for much of the land within Nye County.

Future land uses in Nye County and Tonopah are expected to follow current trends. Ranching use is projected to remain steady, while mining is projected to increase.

Land use control on private land is exercised by the County Commissioners and the County Planner through enforcement of building codes, subdivision regulations, and the Land Use Plan. This control extends over the entire county including unincorporated communities such as Tonopah; only the incorporated town of Gabbs is exempt. Nye County has no zoning regulations at the present time and none are proposed.

Given the large percentage of federal land in Nye County, Forest Service and BLM management programs will continue to have great influence on land use in the county.

The Toiyabe National Forest Land and Resource Management Plan (Record of Decision 1986) "emphasizes developed and dispersed recreation, high-quality wilderness, minerals, wildlife, and fire protection while maintaining livestock and wild horses at close to current levels." It recommends designation of a wilderness area around

Mount Jefferson, approximately 8 miles northeast of Round Mountain, but specifically mentions mineral development potential as part of the rationale for not extending the area farther south.

The Management Framework Plan for the BLM's Tonopah Resource Area generally follows a philosophy of multiple use, maintaining existing uses and activities. Specific considerations pertinent to the project area include:

- Support of the community of Round Mountain through transfer of public land to private ownership for community expansion.
- Establishment of a community material (gravel) pit to supply needs at Round Mountain.
- Consideration of community expansion needs in the management of grazing allotments in the Big Smoky Valley.

2.7.2 Recreation

Outdoor recreation resources in the region range from historic ghost towns such as Belmont, Manhattan, Berlin, Ione, and Goldpoint to hunting, fishing, and camping opportunities in the Toiyabe, Toquima, Monitor, and Kawich Mountain Ranges.

Nye County has abundant outdoor recreational activities. Open space areas of the Toiyabe National Forest and BLM lands provide habitat for game species such as elk, deer, desert bighorn sheep, antelope, and a variety of small game and fowl.

Hiking, hunting, and off-road vehicle touring represent the largest outdoor recreation uses in the study area. Campsites within the study area in the Toiyabe National Forest include Peavine Creek Campground approximately 14 miles from Round Mountain with 7 sites, Kingston Campground approximately 45 miles from Round Mountain with 11 sites, and Salsbury Wash, approximately 68 miles from Round Mountain with 12 sites.

The SVCO expansion site is currently used for mining, therefore limited recreational use occurs.

No wilderness study areas or unique recreational resources would be directly impacted by the project. However, the Mount Jefferson area, located approximately 8 miles northeast of Round Mountain, has been recommended for wilderness designation. Wilderness designation would likely encourage more back country travelers to the area.

Urban recreational activities are provided in both Round Mountain and Tonopah. Both towns provide parks and group activities. Tonopah has six town parks, an outdoor swimming pool, five tennis courts, six town ballfields, playgrounds, and rodeo and fairgrounds. In addition, Tonopah has a private health club and bowling alley. Softball is a popular summertime activity.

Round Mountain has one small park, a baseball diamond, a track, a gym, and four tennis courts; Round Mountain Gold Corporation (RMGC) built the baseball diamond and track for the town. Round Mountain has inadequate recreational facilities for the existing population. The town would like to upgrade and expand the recreational facilities and parks and build a swimming pool.

2.8 Cultural Resources

2.8.1 History and Background

Between the years 1900 and 1920 Nevada witnessed the birth of dozens of mining camps and towns throughout the central part of the state. Round Mountain was founded in 1906 as one of the "satellite" camps generated by the gold strikes of Tonopah and Goldfield. The Round Mountain mining district recorded approximately $8 million in production through 1940. Round Mountain experienced only a moderate rush during its initial gold discoveries so the camp was not over-built, over-speculated, or overpopulated. This resulted in rather modest buildings in comparison to the substantial buildings erected in Tonopah and Goldfield.

These stabilizing factors along with the profitable introduction of hydraulic placer mining by 1908 helped Round Mountain weather the Panic of 1907 and kept gold production from both deep and placer operations at a relatively high rate through 1919. There was a decline in mining in the 1920s, and the population fell from an all time high of 600 to 371 in 1920 to 231 in 1930. The first half of the 1930s was a good time for the Round Mountain mining district. The active mining companies had been consolidated to form Nevada Porphyry Gold Mines, Inc. and therafter all mining in Round Mountain was done by one company. Except for intermittent placer and lode mining during the 1940s and 1950s, the district was quiet from 1936, when deep mining ceased, until the 1970s when the price of gold started to rise.

2.8.2 Cultural Resources Inventory

2.8.2.1 SVCO Archaeological Inventory. Archaeological Research Services, Inc. (ARS) conducted a Class III cultural resource inventory of approximately 3,900 acres of public land associated with the expansion of the Smoky Valley Common Operation (and a buffer area) during April and May 1987. The archaeological work also included testing of two historical period sites to evaluate their eligibility for the National Register of Historic Places (NRHP).

The Class III inventory was designed in compliance with the following federal laws and regulations regarding protection of cultural resources: Antiquities Act of 1906, National Historic Preservation Act of 1966, Executive Order 11593, National Environmental Policy Act of 1969, and Archaeological and Historic Preservation Act of 1974. Actual field procedures were conducted according to general guidelines for cultural resource surveys issued by the Nevada State Office of the Bureau of Land Management in June 1985.

All of the BLM and Forest Service property in the project area was inventoried according to discussions with the Tonopah Resource Area Office, with the exception of several hundred acres of previously disturbed ground.

Most of the project area encompasses the nearly flat bajada on the western edge of the Toquima Range in the Big Smoky Valley. The eastern edge includes several foothills to that range. Elevations range from approximately 5,900 feet to 6,950 feet. No perennial surface waters are known in the project area. Vegetation is dominated by the shadscale plant community (see Section 2.5, Vegetation). Exceptions to this pattern include patches of big sagebrush and low or bud sagebrush.

The Class III inventory resulted in locating and recording 157 cultural resource locations. These are listed in the Cultural Resources Technical Appendix. Prehistoric remains are scarce, comprising only 15 of the total; however, they present a wide age range from at least 6000 B.C. to possibly as late as A.D. 1850. Most abundant are historic period trash scatters consisting of tin cans, bottles, barrel hoops, and other forms of debris. Of the 98 recorded trash scatters, most can be assigned a pre-World War II date and many are certainly pre-1930, based on the presence of diagnostic marks or manufacturing techniques. Mining prospects are abundant, both with and without any artifacts, diagnostic or otherwise. Finally, a number of locations include remains of buildings such as residences, root cellars, and mills. Two sites in this last category were tested to evaluate their eligibility for the NRHP.

Prehistoric remains are probably scarce due to the lack of a perennial water supply disallowing more frequent or permanent habitation. These remains reflect hunting, gathering or very ephemeral forays into the project area. Locating and recording these remains has reasonably documented their information potential. None is deemed significant or eligible for the NRHP; no further work is recommended.

Pending completion of on-going historical research, less certain statements are offered regarding some of the historic period remains. Judgements regarding significance and eligibility for the NRHP will probably depend on situating the physical remains in a context of regional history or assessment of the archaeological remains in terms of anthropological theory regarding early twentieth century mining and settlement in Nevada. For example, two sites were tested to evaluate their eligibility for the NRHP; based on the archaeological results, neither is judged likely to yield significant information about the past, and no further work is recommended. However, it is recommended that additional historical research be conducted to learn more about the two structures, their occupants, and activities.

The archaeological examination of the Round Mountain townsite suggests that much of the town's non-structural (i.e., food refuse, personal discards) archaeological remains have been removed or destroyed. The intensive inventory in the surrounding area and the limited examination of Round Mountain indicate a largely disjunctive pattern between the site of habitation and the selection of trash disposal areas. This may have the effect of limiting the functional or other interpretive methods often applicable to residential sites. One pattern discerned during the inventory was to find early period trash dumps (circa 1906 to 1930) adjacent to now abandoned or little used roads leading away from the town. In some cases, the patterning of discard is intensive suggesting perhaps a community perception of a "town dump." In other instances, the dumping episodes are small and isolated, perhaps reflecting the inconvenience of the "town dump" or a disregard for its existence.

2.8.2.2 Architectural Survey of Round Mountain Townsite. Rainshadow Associates reviewed existing documents on the history of Nye County mining towns, the history of Round Mountain, and specific research conducted on individual historic buildings within the townsite of Round Mountain. This information was gathered from the Nevada Division of Historic Preservation and Archeology, the Nevada Historical Society, and the Central Nevada Historical Society.

In 1980, Janus Associates inventoried 37 buildings in Round Mountain; 18 of the 37 were identified as potentially eligible to the National Register of Historic Places. The W. H. Berg House (RM-101) was identified as being individually eligible to the National Register. The other 17 (RM-117 through RM-133) were cited as contributing buildings within a district proposed on Stebbins Hill. In 1984, the W. H. Berg House was listed on the National Register of Historic Places. The buildings on Stebbins Hill, in private ownership, have subsequently been destroyed.

The inventory forms prepared in 1980 by Janus Associates for the 37 buildings identified within the townsite of Round Mountain were updated to include current condition and use, subsequent alterations, and current black-and-white photographs. This information was gathered through a site visit in April 1987. The original townsite of Round Mountain was searched and additional structures were included in the inventory. Inventory forms similar to the existing inventory forms were prepared. All inventoried buildings have been located on a map provided by the mining company (see the Cultural Resources Technical Appendix). Mrs. Karl (Arleen) Berg was interviewed on the Berg family history and helped identify the buildings that have been demolished since 1980.

2.9 Aesthetics

2.9.1 Visual Resources

The BLM has implemented a visual inventory and analysis process to provide a systematic interdisciplinary approach to the management of aesthetic values on public lands. The Visual Resource Management (VRM) system inventories existing scenic quality and assigns visual resource inventory (VRI) categories based on a combination of scenic values, visual sensitivity, and viewing distance zones. Four visual resource classes have been established to serve two purposes: (1) as an inventory tool portraying relative value of existing visual resources, and (2) as a management tool portraying visual management objectives. Management objectives for each of the visual resource classes are listed in Table 2.9-1.

Three VRM classes (II, III, and IV) and a visual rehabilitation area exist in the study area as illustrated on Figure 2.9-1. The mine area, the existing town of Round Mountain, and the proposed new village are all located in the visual rehabilitation area.

Fourteen BLM Scenery Quality Rating Units were identified by the BLM Battle Mountain District for the entire Big Smoky Valley. These units correspond to portions of the landscape that display similar visual characteristics.

Values (A, B, or C) were assigned to each unit based upon the scenic quality of the unit in relation to other units in the area. The Toiyabe Mountains west of Highway 376 and the Mount Jefferson area of the Toquima Range east of Round Mountain were designated as outstanding scenery (Class A). The alluvial area east and south of the Toiyabe range, the northern Toiyabe range, the alkali flat adjacent to Highway 376, the Simpson Park Mountains, the San Antonio Mountains, the Crescent Sand Dunes, and the north and south Toquima Range were designated as moderately high quality scenery (Class B). The remaining Big Smoky Valley floor was designated as the lowest relative quality scenery (Class C). For a detailed technical discussion of existing visual resources in the areas potentially affected by the proposed SVCO expansion, refer to the Visual Resources Technical Report (ERT 1980) prepared in support of the Draft Environmental Impact Statement, Anaconda Nevada Moly Project, incorporated here by reference.

2.9.2 Noise

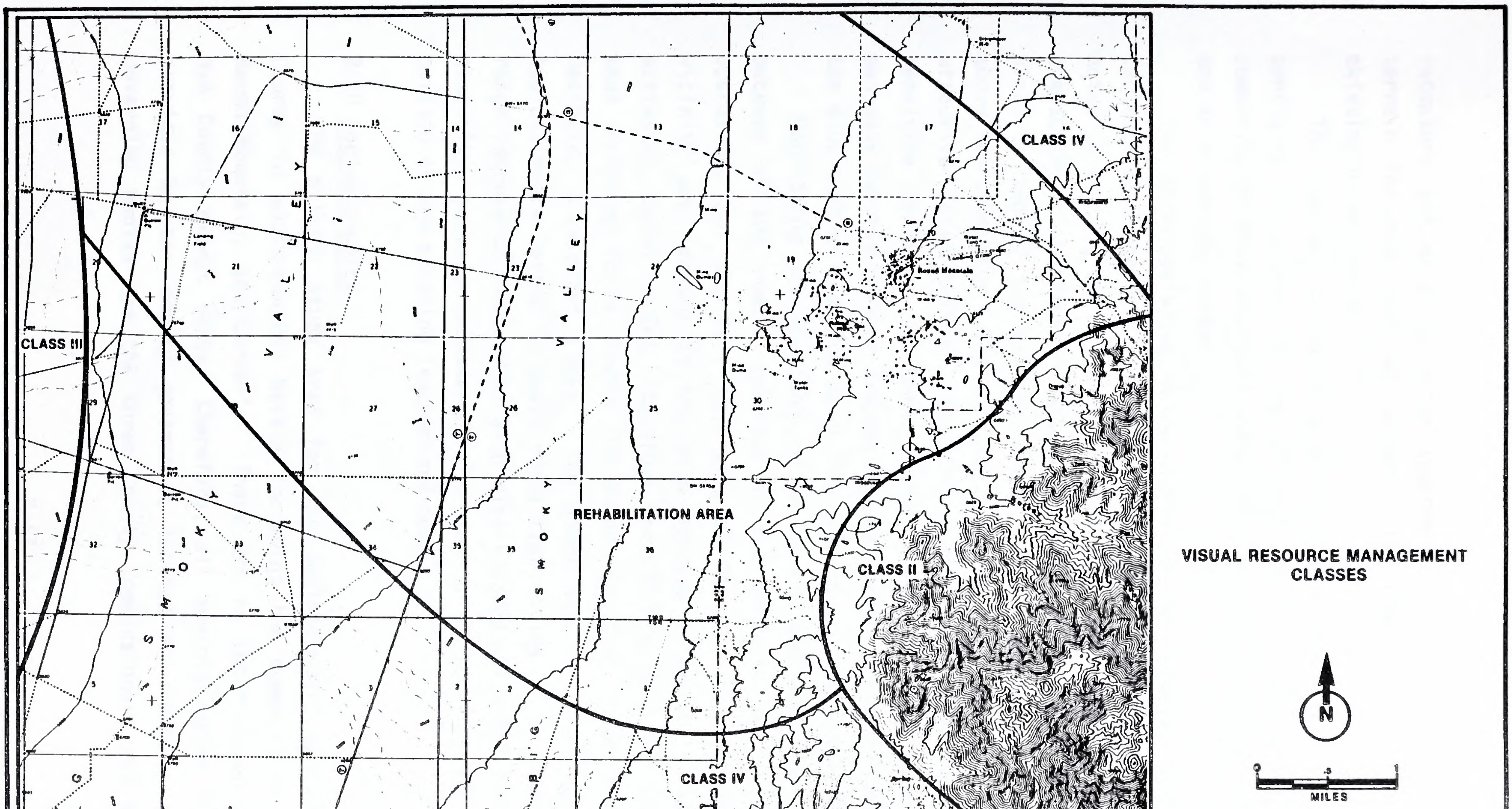
Describing the environment potentially affected by noise emissions from the proposed expansion includes identifying noise sensitive

TABLE 2.9-1

VISUAL RESOURCE MANAGEMENT CLASSES

Class I Objective:	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
Class II Objective:	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
Class III Objective:	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
Class IV Objective:	The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.
Rehabilitation Areas:	Areas in need of rehabilitation from a visual standpoint should be flagged during the inventory process. The level of rehabilitation will be determined through the resource management planning (RMP) process by assigning the VRM class approved for that particular area.

Source: BLM manual 8411.



SMOKY VALLEY
COMMON OPERATION EXPANSION

Figure 2.9-1. Visual Resource Management Classes in Project Area

receptors and existing noise sources in the vicinity, characterizing terrain features that may affect noise transmission, and determining existing noise levels.

The SVCO is located in a sparsely populated, rural valley. Noise sensitive receptors in the project vicinity are clustered in the community of Round Mountain where there are approximately 300 residences and an elementary school.

The major existing noise source is the current mining operation centered approximately 1.75 miles from the edge of town. There is some noise generating activity within 0.25 mile of the town from dumping and compacting of leached ore materials, but such activity currently takes place on top of the existing waste rock dump, approximately 200 feet above the community. The existing waste rock dump functions as a highly effective noise barrier, blocking most mine-related noise from the sensitive receptors in Round Mountain. In effect, there is a large man-made terrain barrier wrapped around the north and northwest sides of the mine complex blocking noise transmission to the community.

Monitoring of existing noise levels was not deemed necessary because of the remote location of the project, the existing mining operation, and the fact that most of the sensitive receptors in the vicinity are located in the area because the SVCO is there. It is estimated, based on EPA literature and ERT file data for similar sites, that existing noise levels in Round Mountain range from 40 to 60 decibels, A-weighted (dBA). The lower end of the range represents typical noise levels in small rural communities. The upper end of the range represents times when SVCO mine-related noise may filter into the community, perhaps because of high levels of activity on the nearest portion of the existing leached ore dump.

2.10 Socioeconomics

The primary study area for the socioeconomic assessment is Nye County in south-central Nevada including the communities of Tonopah, Round Mountain, and Carver's. There are no incorporated towns within Nye County except Gabbs; therefore, all administrative functions are provided by the county government located in Tonopah. The primary governing bodies are the three County Commissioners and the Planning

Commission. Other advisory bodies include a seven-member school board, a five-member hospital board, and other select town boards.

Round Mountain is considered a "town" in Nye County and operates with a town board. The town has a mill levy and generates ad valorem tax revenues for the school district and county. Federal agencies such as the Forest Service and BLM play a major administrative role in Nye County since nearly 95 percent of the 18,064-square-mile land area is under federal control.

2.10.1 Population

The population of Nye County has increased by 226 percent between 1960 and 1985. Overall, the county showed a 57.5 percent growth rate from the 1980 U.S. Census count of 9,048. Areas showing the greatest growth were Pahrump, Round Mountain/Smoky Valley, and Tonopah with growth rates of 293.7 percent, 98.8 percent, and 71.1 percent respectively, over the population reported in the 1980 Census. Most of the growth can be attributed to increased military and mining activity. Table 2.10-1 shows the populations of Nye County, Tonopah, and Round Mountain/Smoky Valley.

2.10.2 Economic Base

The economy in Nye County depends largely on two basic industries, mining (oil and hardrock) and military service activity including Nellis Air Force Base, Tonopah Test Range, and the Nevada Test Site.

Other important sectors include tourism and government. Tonopah acts as a regional center for Nye County, since it is located midway between Reno and Las Vegas. It is also the county seat of Nye County and provides countywide public services and facilities.

2.10.3 Employment and Income

Due to the nature of the primary industries in the area (mining and military), it is understandable that fluctuations in employment and income occur regularly. The frequent upswings and downturns of the major economic sectors cause instability among the non-basic sectors and result in fluctuations in unemployment rates and a general sense of economic instability. Table 2.10-2 shows employment by place of work

TABLE 2.10-1

STUDY AREA POPULATION 1960 TO 1985

	1960	1970	1980	1985	Percent Change 1960 to 1985
Nye County	4,374	5,599	9,048	14,250	225.8
Tonopah	1,679	1,716	1,952	3,340	98.9
Round Mountain/ Smoky Valley	195	215	574	1,141	485.1
Nevada	285,278	488,738	800,508	1,001,530	251.1

Sources: U.S. Bureau of the Census, Census of Population 1960, 1970, 1980: Bureau of Business and Economic Research, Special Census of Nye County, Summary Report - August 1985.

TABLE 2.10-2

EMPLOYMENT BY PLACE OF WORK (ANNUAL AVERAGE)[1]

1981-1985

	1981	1982	1983	1984	1985	1985 Percent of Total
Total: All Industries	8,130	8,640	8,630	9,110	9,780	100
Mining	1,550	1,430	1,130	1,220	880	9.0
Construction	420	160	110	100	250	2.5
Manufacturing	90	90	80	80	90	<1.0
Transportation & Public Utilities	150	160	140	180	140	1.4
Trade	500	480	440	470	510	5.1
Finance, Insurance & Real Estate	320	170	150	210	220	2.3
Service Industries	4,400	5,470	5,820	6,100	6,910	70.7
Government	660	670	760	800	780	8.0
Unemployment Rate	4.5	8.0	8.0	4.4	6.2	

Source: State of Nevada Employment Security Department.

[1] Reflects non-agricultural employment by place of work. Includes all workers in Nye County regardless of place of residence and includes multiple job holders.

from 1981 through 1985 for Nye County. Fluctuations in the mining and construction sectors have occurred throughout the period. The services sector represents 71 percent of total employment and has shown a steady increase from 1981 through 1985.

Recently, mining activity has shown a dramatic increase in exploration and production. Statewide employment in gold and silver mining operations grew from 4,499 in 1985 to 6,627 in 1986. Nye County mining employment accounted for 20 percent of the state total. The mining sector represented the second largest employment sector in 1985 with 9 percent of total employment, followed by the government sector at 8 percent (Nevada Employment and Security Department 1987).

The 6.2 percent unemployment rate in Nye County has remained lower than the state average of 8 percent in 1985, despite fluctuations in employment among sectors. This implies that population out-migration has kept pace with changing job opportunities.

Between 1981 and 1985, per capita income increased by 33.1 percent to $11,509; the state per capita income increased by 25.1 percent to an average of $14,488. Nye County ranks 8th out of 15 counties in Nevada in per capita income.

2.10.4 Public Fiscal Conditions

Financial resources of the study area refer to government revenue sources and expenditures in Nye County and its communities. These financial statistics are important in helping to determine the fiscal impacts of industrial development on local government jurisdictions.

From 1983 to the current fiscal year 1987, assessed valuation throughout the area has grown at a moderate rate. Table 2.10-3 shows assessed valuation for Nye County, Tonopah, Round Mountain, and the SVCO. The SVCO showed the highest growth at an average annual rate of 16.0 percent followed by Round Mountain at 10.0 percent. Tonopah has shown minimal growth reflecting the closing of the Anaconda molybdenum mining operation. As expansion at the SVCO occurs, the assessed valuation of the town of Round Mountain and the SVCO will escalate accordingly.

Operating revenues for Nye County have increased at an annual rate of 0.6 percent from 1984 to 1986 compared with expenditure increases

TABLE 2.10-3

ASSESSED VALUATION BY JURISDICTION

	Tax Rate/ $100 of Assessed Valuation[1]	Fiscal Year[2] 1984-1985	Fiscal Year[2] 1985-1986	Fiscal Year[2] 1986-1987	Average Annual Increase (%)
Nye County	0.5349	$ 280,987	$ 310,566	$ 328,156	8.1
Tonopah	0.1430	29,006	30,555	31,185	3.7
Round Mountain	0.5064	12,419	15,096	15,013	10.0
Smoky Valley Common Operation	NA	5,142	6,231	6,918	16.0

Source: Nevada Department of Taxation.

[1] 1986-1987.

[2] Thousands of dollars.

averaging 13 percent. The largest revenue increases have occurred in service charges, primarily utility charges. The greatest increase in expenditures has occurred in community support activities and highways and streets. Nye County operates largely with funds generated from local and state sources. Inter-governmental revenues, mostly from supplemental city and county relief tax receipts, represent close to 50 percent of the county's total operating budget. Ad valorem and other taxes contribute approximately 31 percent. General government (26.5 percent), public safety (28.7 percent), and highways and streets (18.9 percent) represent the largest expenditure categories for Nye County.

Annual operating revenues for Tonopah have increased 1.2 percent from 1984 to 1986; expenditures have decreased by 8.9 percent during the same period. Property taxes accounted for the largest increase in revenue, while general government expenditures increased the most compared to decreases in other governmental services.

Tonopah has four governmental funds and one proprietary fund. The General Fund, Convention Center and Parks Fund, Capital Project Fund, and Debt Service Fund provide governmental services to the population of Tonopah. The General Fund operates with 67.3 percent inter-governmental revenues composed primarily of basic and supplemental city relief tax receipts. Ad valorem tax receipts contribute another 6.7 percent to revenues in the General Fund. The Convention Center and Parks Fund revenues come primarily from room tax receipts and charges for services. Transfers from the General Fund also contribute to the operation of this fund. The Debt Service Fund is supported by two General Obligation Revenue Bonds. The Utility Fund operates with water and sewer fees and charges for services. Water and sewer fees in Tonopah are the highest in Nevada.

Public Safety represents the largest expenditure outlay by Tonopah (59.9 percent) for General Fund activities, followed by transfers to the Convention Center and Parks Fund (11.4 percent) and highways and streets (10.3 percent). The Convention Center and Parks Fund has the largest single expenditure outlay of $181,329 for fiscal year 1986-87. This fund maintains and operates the convention center, parks, pool, fairgrounds, and ballfields. Expenditures and revenues have declined over the period in Tonopah. Revenues in Round Mountain are primarily expended on culture and recreation activities (57.1 percent), including operation of the gym and library, and community support (24.2 percent) which supports the activity bus to Tonopah. Expenditures have increased at a faster rate than revenues during the period, 7 percent, compared to a decrease in revenues of 3.5 percent.

Annual operating revenues for Round Mountain have decreased by 3.5 percent over the period 1984 to 1986, while expenditures increased by 7 percent for the same period. The only increase in revenues was in inter-governmental resources. The major increases in expenditures occurred in Community Support for bus transportation to and from Tonopah and public safety.

Round Mountain operating revenues are derived primarily from property taxes (46.9 percent) and inter-governmental revenues (26.5 percent); fund balances represent another 23.2 percent of total operating revenues for 1986-87. Round Mountain has revenues to provide adequate governmental services, although many capital facilities and services need to be constructed or upgraded including a new park and a new library. Monies have been set aside for expansion of the town-operated facilities.

The town of Round Mountain provides few services to the population. The town maintains and operates three buildings including the fire station, Town Hall, and the gym and library building. Water and sewer services as well as unscheduled road maintenance are provided by the RMGC. The county provides police protection, the landfill, and some road maintenance. Generally, governmental services are adequate, but need to be upgraded, expanded, and consolidated.

Bonded indebtedness is limited by state statute to 10 percent of the last assessed valuation for the county. Neither Nye County, Tonopah, or Round Mountain are close to their statuatory limit. Nye County's total outstanding debt is $430,906. Tonopah has two General Obligation Revenue Bonds for the convention center building with outstanding balances of $5,000 and $190,000 as of June 1, 1986. Total outstanding debt as of June 1, 1986 was $245,000. The Utility Fund debt was paid off in 1986. Round Mountain has no outstanding debt.

2.10.5 Housing

The condition and availability of housing stock varies throughout the region. Nye County showed an increase of 2,109 year-round housing units from 1970 to 1980. The 1985 special census indicated total year-round housing units had grown by 1,766, for a total of 5,968 dwelling units county-wide. Of the 5,968 dwelling units, 2,182 are located in the project study area. Table 2.10-4 shows total housing units in the Tonopah enumeration districts and the Big Smoky Valley which includes Carver's, Round Mountain, and Manhattan.

The condition and type of housing varies throughout the county. The 1985 special census shows that of the 450 housing units in the Big Smoky Valley, 82.4 percent are mobile homes and 12.7 percent are wood frame homes.

Tonopah shows a wider range of dwelling unit types. Wood frame and brick houses represent 35.9 percent of the total housing stock, mobile homes 24 percent, manufactured housing (modular) 16.9 percent, and multi-family housing 16.2 percent (the "other" category comprises the remaining 7 percent).

Housing costs and availability throughout the study area are similar due to the current high demand for housing caused by increased mining activity and military operations. In 1980, the median value for a single-family unit was $35,600 in Nye County; in 1984 the cost had risen to $60,000 in Tonopah. A survey completed in January 1987 by Trish Rippie Realty of Tonopah suggests housing costs range from a low of $50,500 for modular homes to $126,000 for custom homes. The median single-family wood frame house sells for $80,000 to $90,000. As of January 1987, the number of housing units listed for sale in Tonopah by Trish Rippie Realty totalled 65. There was no housing for sale in Round Mountain, Manhattan, or Carver's.

Rents in Tonopah range from $290 for a 1-bedroom efficiency to $675 for a 3-bedroom condominium. Currently, the rental market is very tight in Tonopah and Carver's, which accounts for the high rental rates.

Table 2.10-5 shows the existing housing stock in the study area, including vacancy rates, rental rates, houses for sale, and temporary accommodations. As shown in the table, there are very few vacancies throughout the area.

TABLE 2.10-4

TRENDS IN HOUSING UNITS 1970 TO 1985

Nye County	1970	1980	1985	1980-1985 Percent Change
Smoky Valley	181	336	460	36.9
Tonopah	964	949	1,724	81.7
Nye County	2,093	4,202	5,968	42.0

Source: U.S. Bureau of the Census 1980, 1985 Special Census of Nye County - Summary Report, Bureau of Business and Economic Research. UNR. 1970 Census of Population and Housing, Microfilm file A.

TABLE 2.10-5

EXISTING HOUSING STOCK IN THE SVCO PROJECT AREA (1985)

	Smoky Valley[1]	Tonopah
1985 Population	1,141	3,340
Housing Units		
Single-Family (SF)	68	619
Modular (SF)	3	291
Mobile Homes (MH)	373	413
Multi-Family (MF)	10	280
Other[2]	6	121
Total	460	1,724
Vacancy		
Percent	3.5%	3.9%
Number	16[3]	68
Rent		
SF/2 bedroom	$275	$300-450
SF/3 bedroom		$400-700
Efficiency		$290-300
MF/1 bedroom	$350	$225-300
MF/2 bedroom		$260-555
MF/3 bedroom		$435-675
MH		$250-450
Mobile Home Space	$105-115[4]	$150-175[4]
Housing for Sale		
All units	NA	65
Range of Values	NA	$50,500-125,200
Average Price	NA	$71,849
Temporary Housing		
Motel	9[5]	667
R.V./Trailer Space	115[6]	70[7]

Sources: 1985 Special Census of Nye County Summary Report; Trish Rippie Realty - Helen Heler-Tonopah; Tonopah Chamber of Commerce; Kenny Berg.

[1] Includes: Round Mountain, Carver's and Manhattan.

[2] Other does not include ascertained unit types.

[3] These units are being reserved for construction workers at the Smoky Valley Mine.

[4] Includes: Water, Sewer, and Trash.

[5] Carver's.

[6] Mobile Home Park.

[7] Does not include Mobile Home Parks.

Developable land is available throughout the study area. Tonopah has a large number of platted residential lots and mobile home spaces available for development.

The Sierra Vista subdivision developed by Anaconda has not been entirely completed. There are many modular homes for sale. In Sierra Vista there are approximately 70 lots with utilities; Puckett and Puckett have taken these lots off the market until all housing is sold. These lots will be developed by the developer sometime in the future (Puckett 1987).

The Tonopah airport area has an additional 150 lots with utilities in the street (Sotak 1987). These lots could also be split to provide smaller lots for trailer spaces. The land has been master planned; it is owned by the federal government and has been leased to a private developer. The government does have the right to repossess the land in the case of a national emergency, which influences the type of housing suitable for this site.

In total, the town of Tonopah and the surrounding area has approximately 150 platted lots with utilities ready for development and an additional 70 available for future development.

The town of Round Mountain is located on unpatented land owned by the federal government. Echo Bay Mines (RMGC) has lode, placer, and millsite claims over a large area including the town, and therefore has a legal right to mine the area and to obtain a patent under the General Mining Laws. The land status question of Round Mountain affects the potential development of the existing townsite. Land ownership in Round Mountain is limited to the possessory surface rights, which does not preclude further mining if the company so desires.

In addition, Round Mountain does not have adequate water to develop within existing boundaries. In order to expand the existing townsite, the water system would have to be upgraded and expanded. The system is currently operating at capacity.

There is land available for development in the Big Smoky Valley. Private, raw acreage with power sells for $2,000 to $3,500 per acre. Outside of Carver's, two 110-acre parcels are available for development. One of the 110-acre parcels has been subdivided and currently has 70 lots for sale. The lots are between 1/3 and 1 acre in size and sell for $9,000 to $10,000 with water, sewer, and electricity. Larger lots are available outside the subdivision (Berg 1987).

The uncertainty of the status of several military operations in the study area and of the mining industry have contributed to the tight housing market. Developers are reluctant to take substantial risks when economic conditions are so volatile.

2.10.6 Public Facilities and Services

Many public facilities and services in the study area are provided by Nye County since communities are generally unincorporated. Existing design capacity and staffing levels of public services and facilities in the region are adequate and many have excess capacity.

Health. Health care is provided in the study area by Nye General Hospital in Tonopah. The staff includes resident and visiting medical staff and non-medical office, administrative, maintenance, and housekeeping personnel.

Ambulance service is operated by Nye County and staffed by volunteer emergency medical technicians (EMTs). Ambulances are housed at the hospital and in Round Mountain. Patients requiring specialized treatment are transported to Reno or Las Vegas by Air Ambulance Service.

Law Enforcement. Law enforcement in the study area is provided by the Nye County Sheriff's Department. The department has 29 full-time employees throughout the county, including six patrol officers in Tonopah, and one deputy each in Round Mountain, Manhattan, and Carver's. The main offices, dispatch facilities, and jail are located in Tonopah (Zane 1987).

Fire Protection. Fire protection is provided throughout the study area. The Tonopah Fire Department has 5 paid and 25 volunteer firefighters many of whom are trained as EMTs. The Big Smoky Valley is protected by three volunteer fire protection departments: Round Mountain Volunteer Fire Department, Round Mountain Fire Brigade, and Smoky Valley Volunteer Fire Department. Fire protection is adequate except for Carver's where the fire chief feels there is an immediate need for 10 additional volunteers (Berg, Cole, Sotak 1987).

Social Services. Social services are provided by the Nevada Department of Welfare, Nye County, and local organizations. The Nye

County offices provide medical assistance, food, and energy assistance on an emergency basis.

Nye County is required to cover all medical expenses for indigents who have been county residents for at least six weeks. This has placed a burden on the county budget during periods of employment instability (Christiensen 1987).

The state administers aid to families with dependent children (AFDC), food stamps, child welfare, and protective services programs.

Water and Sewer. Water and sewer services within the town of Tonopah are provided by Tonopah Public Utilities (TPU). TPU is a public utility owned and operated by the town of Tonopah.

The TPU water system serves all residents of the town of Tonopah. The original Tonopah water system was constructed in 1903. Since that date, many additions and improvements have occurred in the storage and distribution systems. Many elements of the transmission system remain the same as originally constructed.

Tonopah is said to have the highest water rates in the state. The TPU water system is primarily constrained by its water supply and source components.

The TPU sewer system serves most residential and commercial users within the town of Tonopah. Current peak daily treatment is at 42 to 45 percent of capacity (Sotak 1987).

Round Mountain water and sewer services are provided by the RMGC. The current water storage and distribution system for Round Mountain is adequate for the current population of the town. As RMGC has added housing units to Round Mountain, new waterline loops and fire hydrants have been added to meet state requirements. The water problem in Round Mountain is one of supply, not distribution. The peak flow available to Round Mountain is inadequate for the community (Barto 1987).

All sewage treatment in Round Mountain is provided by individual septic systems. Most of the septic systems are less than 10 years old.

Electricity. The project study area receives electric services from Sierra Pacific Power Company, an investor-owned utility, with headquarters in Tonopah.

There is adequate generating capacity to service the mine needs and those associated with incoming population for the next few years (Van Pool 1987). However, mine expansion would require a new substation. Once the new substation is on-line, adequate service capacity would be available for the area far into the future.

Schools. Nye County is a unified school district headquartered in Tonopah. Currently, schools in the study area are near or over capacity. In Round Mountain and Tonopah, modular units are being used to house additional students. The demand for additional space is generally at the elementary levels, and is occurring most dramatically in Round Mountain (Johnson 1987).

There are five schools in the Round Mountain-Tonopah study area.. Round Mountain has a primary school and an elementary school with enrollment capacities of 68 and 89, respectively. Both schools have enrollment well over capacity with a 1985-1986 enrollment total of 248. In addition, the condition of the Round Mountain primary school is considered poor.

Tonopah has three schools: Silver Rim Elementary with a 1985-1986 enrollment of 196 and a capacity of 270; Tonopah Elementary with a 1985-1986 enrollment of 231 and a capacity of 300; and the Tonopah Junior/Senior High School with an enrollment of 419 and a capacity of 731. Tonopah Elementary and the Tonopah High School are considered in fair condition.

The town of Tonopah has experienced a boom and bust situation associated with the inactive Anaconda molybdenum mine, the proposed MX missle project, and various other military activities. Tonopah experienced a peak total school enrollment of 863 in the 1981-1982 school year which has sub-sequently fallen to a 1985-1986 enrollment of 650. Currently, Tonopah has excess capacity to accommodate additional students, nevertheless, the uncertainty of expansion in the basic sectors of the Tonopah economy makes it difficult to perform capital project planning for the future. It is uncertain what level of military and mining activities will prevail in the near future.

In contrast, Round Mountain enrollment has grown steadily throughout the same period averaging an annual growth of 18.1 percent.

Total enrollment has grown from 108 to 248 from 1985 to 1986. With increased exploration activity and prevailing positive economic conditions for gold and other metals mining, it is likely that Round Mountain, Carver's, and Manhattan will continue to experience rapid growth. The Round Mountain facility and teacher situation is considered a crisis area for the Nye County School District due to current and projected enrollments.

The assessed valuation of the Nye County School District has more than doubled over the past five years. These increases are primarily due to increased mining activity and prices for the mineral products, plus new businesses, home sites, and agriculture. The assessed valuation in Nye County for fiscal year 1986-1987 was $328,156,388 which generated tax revenues of over $12 million.

The expenditure allocation per student in the State of Nevada is $2,629. In Nye County, the total basic support for enrollees is $6,931,096; of this total, approximately $2,295,117 goes to Round Mountain and Tonopah.

The county-wide school district operating budget for fiscal year 1986-1987 is $14,315,571. General Fund and Debt Service expenditures represent 85 percent of the total budget. General Fund expenditures include salaries, benefits, supplies, property, etc. for all educational programs. Sources of funding for General Fund programs is 44 percent local (ad valorem taxes), 48 percent state, and 8 percent federal and other sources.

It appears that operating budgets for existing enrollments appear adequate district-wide. Problems exist in facilitating capital improvement projects due to bonding requirements. In order for a bond issue to pass, the majority of Nye County must approve the bond. Because of the size of the county, areas lacking population, such as Round Mountain, are unable to get a majority vote on a bond issue for a capital project in their area. Therefore, school facilities and staffing are inadequate for a large portion of the school district. Nye County has an excess bonding capacity of $42,298,458, with an outstanding balance as of June 1, 1986 of $6,925,000.

2.11 Transportation

The transportation system in Nye County is influenced by the large land area of the county, geographic and land use constraints (e.g., the Nevada Test Site), low population densities, and the remoteness of many communities from major towns and cities. This has led to a heavy reliance on surface transportation, particularly an extensive highway network. The network consists of nearly 3,000 miles of federal, state, and county roads and highways, about one-third of which are paved.

The major highways in Nye County are U.S. 95 and U.S. 6. U.S. 95 serves as the primary link between Tonopah and Las Vegas to the south and Reno to the north. U.S. 6 is a major east-west highway providing easterly access to the eastern portions of Nye County, Ely, and Salt Lake City, and westerly access to California. These two highways intersect in Tonopah, making the town a focal point of travel in and through Nye County. Round Mountain and the SVCO are located about 60 miles north of Tonopah on State Highway 376 (formerly 8A). S. H. 376 continues northerly an additional 50 miles through the Big Smoky Valley, intersecting U.S. 50 near Austin. All of these major highways are paved, all-weather roads. They are two-way, rural highways with one 12 to 14-foot wide travel lane in each direction.

Capacities of these facilities under ideal weather conditions with the long sight distances common in the area are approximately 14,000 vehicles per day (Barry 1987). Capacities may be reduced by large numbers of trucks in the traffic stream, by hills and curves, and by less than ideal weather.

Current traffic volumes are well below capacity in all cases as indicated in Table 2.11-1. Projected volumes for these roadways indicated "A" levels of service will be maintained beyond the year 2000 (Barry 1987).

There are numerous small airports in Nye County. The largest of these, Tonopah Airport, is 8 miles east of the town of Tonopah. It has two paved runways (the longest is 8,900 feet long), a fixed-based operator providing charter flying services, and a Federal Aviation Administration Flight Service Station. There is no scheduled passenger air service in Nye County.

TABLE 2.11-1

1985 TRAFFIC VOLUMES IN TONOPAH AND BIG SMOKY VALLEY

	U.S. 6 Between S.H. 376 and Tonopah	U.S. 6 East of S.H. 376	S.H. 376 South of SVCO	S.H.376 Between SVCO and Carvers	S.H. 376 North of Carvers
Maximum Capacity	14,000	14,000	14,000	14,000	14,000
Average Annual Daily Traffic	1,500	1,355	325	590	255
Volume/Capacity Ratio	0.11	0.10	0.02	0.04	0.02
Level of Service	A	A	A	A	A

Source: Barry 1987.

There are two unimproved dirt landing strips near the proposed project, one 4 miles west of the SVCO and a second on the northeast edge of Round Mountain. Neither has any support services available. A new 7,500-foot long airstrip is scheduled to be built 3 miles west of the SVCO to accommodate larger aircraft. No support services are planned for this facility.

3.0 ENVIRONMENTAL CONSEQUENCES

Chapter 3 presents a discussion of the environmental consequences that would result from the construction, operation, and abandonment of expanded facilities for the Smoky Valley Common Operation (SVCO) or the alternatives. The chapter is organized as follows: Sections 3.1 to 3.11 present conclusions of the environmental consequences by resource topic; Section 3.12 lists recommended mitigation and monitoring programs; and Section 3.13 provides a summary and comparison of alternatives.

3.1 Air Resources

Proposed Action

Impacts to air quality from the proposed expansion of the SVCO are expected to be similar in nature to the existing operations at Round Mountain. The primary air pollutant is expected to be particulate matter from mining, hauling, crushing, and ore handling operations. The expected magnitude of particulate emissions are listed in Table 3.1-1. The emission estimates on this table assume production from the mine and mill at 35,000 tons of ore per day. For the mine, ore and waste hauling are the principal emission sources, while secondary and tertiary crushing make up the primary ore processing emission sources.

Round Mountain Gold Corporation's (RMGC's) proposal includes standard emission control practices to reduce dust emissions. At the ore handling and processing facilities, this includes the use of baghouses, wet scrubbers, water sprays, and enclosed conveyor transfer points to control particulate emissions from crushing and screening, stockpile reclaim, and conveyor transfer points. Dust control practices at the mine include use of water or chemical suppressants to reduce fugitive emissions from haul road traffic. In addition, the higher moisture content of Type II ore relative to Type I ore serves to reduce overall dust emissions.

The impact of particulate emissions from the proposed mine expansion will be regulated by the Nevada Division of Environmental Protection (NDEP). NDEP will review the proposal to ensure emissions do

TABLE 3.1-1

ESTIMATED PARTICULATE EMISSIONS FROM THE SVCO EXPANSION

Source	Emission Control	Estimated Emissions (lb/day)
Drilling	None	182.0
Blasting	High Moisture	2.5
Truck Loading-Ore	High Moisture	10.26
Truck Loading-Waste	High Moisture	30.77
Truck Hauling-Ore	Watering Roads	2,351.0
Truck Hauling-Waste	Watering Roads	16,098.0
Truck Unloading-Ore	Water Sprays	1.79
Truck Unloading-Waste	High Moisture	8.59
Primary Crushing	Baghouse	1.75
Sec./Tert. Crushing	Wet Scrubber	48.44
Ore Handling/Transfer	Baghouse, Enclosure, or Water Sprays	1.66

not exceed applicable regulations and expected impacts are within air quality standards. Compliance with these limits was checked here by the use of a standard atmospheric dispersion model using the emissions data for process emission sources (i.e., excluding the mining emissions) from Table 3.1-1 and meteorological data from the Round Mountain mine. Mining emissions are not included by NDEP in their permit review modeling. The predicted impacts from the model are given in Table 3.1-2. These impacts are well below the applicable State of Nevada air quality standards.

Mining emissions, although not specifically modeled in the above analysis, may cause some impact to air quality. Such impacts are most pronounced during dry conditions when strong winds entrain dust particles and carry them downwind. However, any impact from mining emissions are expected to be infrequent and highly localized.

Construction of the new village and new mine and processing facilities will also generate some dust emissions, but these levels and impacts should be similar to that of the SVCO operations.

In summary, air quality impacts from the proposed SVCO expansion are expected to be insignificant and similar to the existing mining operations.

No Action Alternative

Under the No Action Alternative, closing of the mine and plant operations would result in the elimination of air pollutant emissions from the mine, ore crushing, and ore handling. Some emissions would probably remain from wind erosion of waste dumps, spent leach piles, and other disturbed areas. However, these wind erosion emissions would be relatively infrequent and would occur only during strong and gusty winds. Stabilizing and reclaiming disturbed areas before abandonment would reduce the potential for wind erosion.

Mining and Processing Alternatives

Conveyor Transport of Leach Residue. The use of conveyors rather than trucks to transport the spent leach residue from the reusable leach pads to the waste dump could result in lower air pollution emissions. The conveyor alternative would have minimal emissions from leach pad

TABLE 3.1-2

ESTIMATED PARTICULATE IMPACTS FROM THE SVCO EXPANSION

Averaging Time	Predicted Impact (μg/m³)	Nevada AQ Standard (μg/m³)
Annual	5	75
24-Hour	44	150

reclaim, leach residue handling and transport, and stacking at the waste dump. Any emissions which do occur can be easily controlled by use of water sprays or other emission control devices at the conveyor transfer points. Installation of the conveyor system would eliminate emissions from the truck exhaust and dust generated by travel along the waste dump haul roads.

In-Pit Crushing and Conveyor Haulage of Waste Rock. This alternative is expected to result in lower overall air pollution emissions from the mine, primarily due to the replacement of ore and waste transfer by truck with a conveyor system. The use of conveyors for ore and waste transfer is expected to reduce overall air emissions and make those emissions easier to control effectively. However, the emission reductions gained by the conveyors would be partially offset by the requirement to crush the waste before conveying. Under the Proposed Action, crushing of mine waste is not required.

For the ore crushing, the use of in-pit versus dedicated primary crushers is expected to have no influence on the overall air emission levels, given that both crushing alternatives have equivalent emission controls.

Alternative Leach Residue Pile Location. The alternative leach residue pile location would result in somewhat higher air pollution emissions because of the longer transport distances as compared to the Proposed Action. These increases would be larger with truck hauling than with the conveyor transport alternative.

Employee Housing Alternatives

The various employee housing alternatives are expected to generate little, if any, differences in air pollutant emissions. Some minor variations between the alternatives may occur primarily due to differences in the average employee commuting distance and the associated vehicle exhaust emissions.

Reclamation Alternatives

No significant differences in air emissions are expected between any of the reclamation alternatives considered. Occasional emissions from wind erosion during high wind speed periods are expected to occur regardless of the level of reclamation and revegetation.

3.2 Geology and Mineral Resources

Proposed Action

The proposed expansion activities would result in a larger overall pit configuration, increased recovery of economic mineral resources, and larger waste material volumes. The increased waste material volumes would occupy greater surface areas along the valley flank near the present pit. None of these areas are known to contain economically recoverable mineral resources; placement of waste material would not preclude future extraction of underlying resources, however, it would increase strip ratios.

Pit abandonment impacts relate to slope stability in pit slopes as well as waste dump and leach residue dump face slopes.

Upon cessation of operational activity, structures would be removed (at minimum down to foundations) in all reclamation alternatives. As such, the potential for major earthquake damage to facilities and structures would be non-existent. Each reclamation alternative considered also specifies contouring of steep slopes with safety benches, as necessary, to ensure slope stability of pit slopes as well as waste dumps. Steep slopes left within the pit (between safety benches) would be comparable to rock outcrops on adjacent ridges and outcrops that were present on the Round Mountain geologic feature. The moderately dipping, fractured, and altered, welded tuff which forms the main host structure within the pit exhibits stability in the existing pit walls and would be expected to continue that degree of stability, subject to the deleterious effects of weathering on fractured and jointed surfaces. The use of safety benches, however, would preclude large-scale stability problems and rockfall hazard in the pit.

Waste dumps and leach residue dumps, with all reclamation options, would be sloped to minimize the hazard potential associated with increased soil pore pressure or seismic-induced liquefaction. Minor disturbances, such as vehicular traffic, might induce downslope soil movement, as would removal of the slope toe (e.g., by excavation or erosion). Due to the shaping of slopes, any slope failure in the waste rock piles or leach residue piles would likely be small in scale and non-catastrophic. Such failures would inhibit revegetation efforts and effectively limit future land use of affected areas.

No Action Alternative

Under the No Action Alternative, the expansion would not occur and pit operations would cease by 1988 due to uneconomic strip ratios. As such, the major impacts for this alternative in this category would relate to pit abandonment/reclamation and non-recovery (in the forseeable future) of an in-place, economic mineral resource.

The No Action Alternative would not prevent future extraction of economic mineral resources, however, removal of the existing mine/plant infrastructure would adversely impact the economic attractiveness of such a venture. Past condemnation drilling resulted in placement of existing waste piles, plant facilities, etc. off mineralized zones of significance. If future economic conditions are favorable, reentry into the pit to access Type II ore could be accomplished even after pit reclamation (benching) and dump contouring.

Mining and Processing Alternatives

Specific geologic hazards (slope stability and seismic hazards) to the alternatives are almost identical to the Proposed Action. The conveyor transport of ore from leach pads and in-pit crushing and conveyor haulage of waste rock would not impact geology as these are operational alternatives within the pit or leach pad area. The alternative leach residue pile location would possess the same general configuration, and would be located over an area not known to contain economically recoverable resources. Geologic impacts, as such, would remain the same as for the Proposed Action.

Employee Housing Alternatives

There are no geologic impacts associated with the employee housing alternatives.

Reclamation Alternatives

Geologic hazards associated with the reclamation alternatives relate to slope stability and soil stabilization. The rock cover in

Reclamation Alternative A would tend to reduce the potential for wind erosion and precipitation-induced erosion over natural conditions; however, that potential would still exist. Vehicular traffic across this type of reclaimed area might induce downslope movement of the cover material, ultimately exposing the leach residue to more intense erosional forces. Likewise, disturbances at the toe of the slope (through excavation or natural erosion) would induce similar downslope movement.

Due to the slope reduction efforts and relatively low profile of the leach residue pile, any slope failure in the pile or within the rock cover system would likely be small in magnitude and non-catastrophic. Such failures would, however, inhibit revegetation efforts.

Geologic hazards associated with Reclamation Alternative B would be the same as those discussed above, though to a much lesser degree. Effectiveness of the cover system would increase (and geologic hazard potential would decrease) as the vegetative cover becomes better established on the leach residue dump. Moisture infiltration would be discouraged by vegetative uptake.

Geologic hazards associated with Reclamation Alternative C would be the same as those discussed in Alternative B above, with the net positive effect of increased stability of additional reclaimed surface areas due to minimized potential for wind or precipitation induced erosional effects.

3.3 Water Resources

3.3.1 Groundwater

Proposed Action

Quantity. The proposed additional groundwater diversion related to the expansion consists of 1,000 gallons per minute (gpm) from two wells for the new village, and 5,000 gpm peak flow (3,400 gpm non-peak flow) from two additional wells for the mining operation. Planned locations for these wells are shown in Figure 1-9, and well information is summarized in Table 3.3-1.

TABLE 3.3-1

INFORMATION SUMMARY FOR NEW WATER SUPPLY WELLS FOR THE SVCO EXPANSION

Well Location	Planned Depth (feet)	Desired Yield (gpm)	Use
10/43-23c	500	2,500	Mining
10/43-23c	500	2,500	Mining
10/43-28b	---	1,000	Village Public Supply

The potential water-level drawdown (interference) impacts of the proposed wells on existing wells in the vicinity of the project were evaluated based on currently available data regarding aquifer characteristics, well locations, and well pumpage rates. The assumptions and results of this simplified analysis (summarized in Table 3.3-2) indicate that drawdown from a 2,500 gpm well varies from 14 feet at a distance of 500 feet from the well to 2 feet at a distance of 1 mile from the well. Although the potential for interference drawdown exists, the impacts of such drawdown would likely be minimal, considering the available saturated thickness of the aquifer. Also, considering the locations of existing wells in the vicinity of the project, only wells supplying the new village and the mine would be potentially affected by the interference drawdown from new wells. In this regard, the spacing of new village and mine wells should consider these potential effects to avoid excessive drawdown in adjacent new wells.

The proposed additional pumpage is not expected to result in groundwater withdrawals which exceed the natural recharge rate to the aquifer. Based on data from Rush and Schroer (1971), the estimated consumption of groundwater in 1968 was 8,200 acre-feet per year, compared to the estimated perennial yield of the northern valley fill aquifer of 65,000 acre-feet per year. These data indicate that the proposed additional pumpage of 6,000 gpm peak flow (9,677 acre-feet per year) should not adversely affect the long-term availability of groundwater in this aquifer. The perennial yield of an aquifer is defined as the maximum amount of natural groundwater discharge that can be salvaged each year over the long-term by pumping, without bringing about some undesired result (Rush and Schroer 1971).

It should be noted that the simplified analysis described above provides only a rough estimate of the potential water-level drawdown impacts from the proposed pumpage. Controlled aquifer pumping tests and superposition of projected drawdown from all pumping wells in the area would be required to determine aquifer characteristics (including boundary conditions) and to quantity potential drawdown impacts of the proposed pumpage.

TABLE 3.3-2

POTENTIAL WATER-LEVEL DRAWDOWN INTERFERENCE IMPACTS OF A PROPOSED SVCO PRODUCTION WELL

Distance from Production Well [ft (mi)]	Water-Level Drawdown Due to Production Well (ft)
100	23.4
500	14.2
2,640 (½ mile)	5.0
5,280 (1 mile)	1.9
10,560 (2 miles)	0.2

Assumptions

1. This analysis for non-equilibrium flow
2. Assumed parameters

Q = 2,500 gpm for a given well
S = specific yield of aquifer = 0.15 (Rush and Schroer 1971)
T = transmissivity of aquifer = 100,000 gal/day/ft (Rush and Schroer 1971)
t = time since pumping began = 180 days (assumed maximum period without groundwater recharge = ½ year)

3. Factors *not* considered in this analysis:

- aquifer parameters from controlled pumping tests
- aquifer boundary conditions
- drawdown impacts from existing production wells
- well efficiency

Quality. Potential groundwater contamination sources associated with the project are summarized in Table 3.3-3. No adverse impacts to groundwater quality are anticipated from any of these sources, as discussed in detail in the following section.

Waste Rock. Waste rock remaining after ore separation would be hauled to dump areas south and east of the mine pit. No impacts regarding leachate from the rock dumps are expected, considering: the small amount of annual precipitation which falls on the area (minimal leachate generation); and the absence of zinc, lead, mercury, or other potentially toxic metals in the ore and waste rock.

Heap Leaching Operation. Gold-bearing ore is leached on a contained leach pad with a dilute cyanide solution (0.05 percent). New pads are to be constructed as follows: compacted base material, 3.5-inch thick layer of hydraulic asphalt, rubber membrane, and a 3.5-inch thick layer of asphaltic concrete wearing course. Leachate from the various leaching events would drain along the downslope side of the pads and be collected by drains.

The leaching system is designed to be self-contained and intrinsically tight in order to prevent the release of toxic cyanide into the environment and to reclaim all available gold and silver from the leach solutions. Leach solution sumps (pregnant, lean, and barren solution) would be constructed of concrete or steel. The 14-million gallon barren solution pond would be double-lined with two 40-mil high density polyethylene (HDPE) liners separated by an intermediate drainage layer for leak detection. The 3.3-million gallon emergency surface water retention pond (to retain overflow from the solution pond) would be equipped with a single 40-mil HDPE liner. All solution pipes would be constructed of HDPE. A system design for a zero discharge facility and review by the State of Nevada for all specifications is required and is currently underway.

After leaching, the leach residue would be washed with clean water to remove residual levels of cyanide, and would be subsequently drained prior to transport to the leach residue dumps. No adverse impacts to groundwater from residual cyanide are anticipated due to the

TABLE 3.3-3

POTENTIAL GROUNDWATER CONTAMINATION SOURCES ASSOCIATED WITH THE SVCO EXPANSION

Source	Management Method	Permit	Anticipated Groundwater Impacts
Waste Rock	Segregated Open Piles	No	None
Heap Leach Operation		Yes	
Leach Solution Sumps	Concrete construction		None
Leach Solution Ponds	HDPE Liners/Leak Detection[1]		None
Leach Solution Pipes	HDPE Construction[1]		None
Leach Residue Rinsing	Water Rinse of Cyanide Solution		None
Leach Residue Disposal	Segregated Impoundments		
Reagent Storage		No	
Cyanide (dry)	Sealed Bags/Boxes		None
Sodium Hydroxide (dry)	Pellets or Sealed Drums		None
Nitric Acid (solution)	Stainless steel tank with perimeter ditch		
Fuel/Lubricant Storage			
Diesel Fuel	Above-Ground Tanks		
Gasoline	Above-Ground Tanks		
Hydraulic Fluid	Above-Ground Tank		
Lubricants	Sealed Drums		
Sanitary Sewage		Yes	None
Mine	3 Septic Tank/Tile Field Systems		
Village	Sewer Treatment Plant		
Solid Waste (Non-hazardous)		Yes	None
Mine	On-site Trenches		
Village	County-Operated Landfill		

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[1] HDPE = high density polyethylene

pre-disposal rinsing process, the natural degradation of cyanide which occurs in heap leach residue piles (Englehardt 1985), and the attenuative capacity of the underlying unsaturated geologic materials (Fuller 1985), which are about 100 feet thick above the water table in the area of the leach facility.

Reagent Storage. Chemical reagents used in the gold and silver processing operation would be stored in appropriate containers, as listed in Table 3.3-3. These materials would be handled in a manner to avoid spills and leaks.

Fuels and Lubricants. Fuels and lubricants would be stored in tanks and barrels, as described on Table 3.3-3. In the unlikely event of a spill or leak, the small amount of product not immediately recovered within the containment area would be absorbed in the 100-foot thick unsaturated zone beneath the site, and would, therefore, not constitute a threat to groundwater.

Sanitary Sewage. Sanitary sewage from the mine is to be disposed of via septic tank and drain field systems (Table 3.3-3), in accordance with Nevada Division of Health requirements. The geologic materials beneath the project area should provide adequate renovative capacity for sanitary wastewaters discharged to these systems.

Solid Waste (Non-Hazardous). Solid waste generated by the mine and new village would be disposed of in on-site trenches and at a county-operated landfill in the valley, respectively, as is the current practice. The on-site trenches would be covered by the advancing waste rock dumps. These solid waste disposal practices are currently permitted by the NDEP. No adverse impacts to groundwater are anticipated from the disposal of non-hazardous solid waste.

Project Alternatives

For the No Action Alternative, impacts to groundwater quantity would possibly decrease if the new village were not built and if the associated new water supply wells were not drilled. The other project alternatives would not affect potential impacts on the groundwater system.

3.3.2 Surface Water

Proposed Action

The potential surface water impacts of the project expansion include:

- The potential for changes in surface water quality and flow,
- The risk of failure of access roads and flooding at the minesite and proposed village, and
- The potential for stream diversion and increase in soil erosion and sediment loading to streams.

Impacts to surface water resources from the proposed expansion are expected to be minimal as a result of the semi-arid climate and the absence of significant surface water. No perennial surface water is present on the project site or in the surrounding area, and the Big Smoky Valley is a closed basin. The only ephemeral stream of any consequence that has the potential to flow through the minesite is Kelsey Canyon which has a mean runoff of about 0.5 cubic feet per second (cfs). This condition already exists with the existing operation, and the expansion should not affect its water quality or quantity.

The risk of failure of access roads that cross Kelsey Canyon and flooding of the minesite from flash flooding is low because peak discharges and volumes should be relatively small. The expansion should not increase this risk.

The expansion of the SVCO would locally alter small drainages south of Kelsey Canyon. These drainages are ephemeral with no mean annual surface water runoff. The altered regime would not affect sediment loading and surface yield.

On the west side of the valley, there is the potential for diversion of Pablo Creek around the proposed village. Stream diversions have the potential for increased erosion and river bed scour. Increased sediment loading is not expected.

Project Alternatives

The surface water impacts from the project alternatives would be similar to the Proposed Action.

3.4 Soils

Potential impacts of the SVCO expansion on native soil resources were evaluated to determine the extent to which project activities would result in either soil compaction or losses via burial or accelerated erosion. Project area soils were also evaluated regarding their suitability for salvage and subsequent topsoil use for reclamation and revegetation.

Proposed Action

Construction and operation of the proposed expansion would result in the unavoidable disturbance of about 2,300 acres of soil resources. The location of suitable topsoil areas with corresponding average salvage depths for the proposed disturbance areas are identified in Figure 3.4-1. Potential topsoil salvage areas are concentrated in the leach residue disposal area, processing facilities areas, and in the southern portion of the proposed wasterock disposal area. Average depths of suitable topsoil range from 12 inches to 24 inches.

No Action Alternative

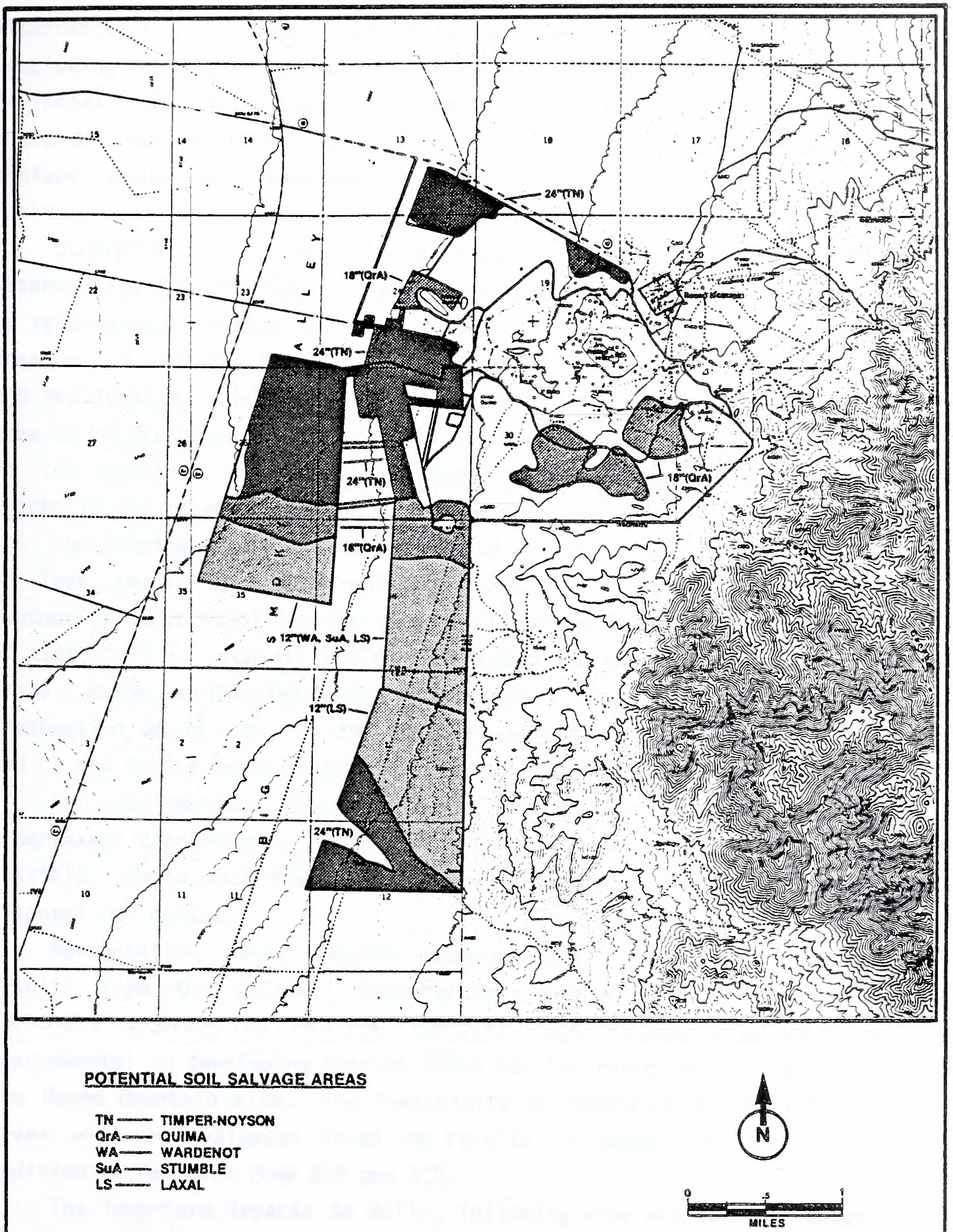
The additional disturbance to soils associated with the proposed expansion would not occur with the No Action Alternative.

Mining and Processing Alternatives

The alternative leach residue dump would impact approximately 675 acres of soil resources. The majority of this area contains salvageable topsoil of depths from 12 inches to 24 inches (Figure 3.4-1). This alternative location of the leach residue dump would provide sufficient topsoil such that Reclamation Alternatives A, B, and C developed for the Proposed Action would remain applicable.

Reclamation Alternatives

Three potential reclamation scenarios have been developed with input from the BLM (Ross 1987). These are discussed in more detail in Section 1.4.4. Under Reclamation Alternative A, no topsoil would be salvaged. Under Reclamation Alternative B, topsoil would be salvaged to an average depth of 12 inches from the leach residue pile and leach pad



SMOKY VALLEY
COMMON OPERATION EXPANSION

Figure 3.4-1. Soil Salvage Areas

area. Reapplication of this material would topsoil these stripped areas to a minimum of 10 inches, the target depth. Under Reclamation Alternative C, all topsoil would be salvaged from disturbance areas (excluding mine pit) containing suitable material down to depths of 24 inches. Stripping topsoil to the depths identified in Figure 3.4-1 would provide sufficient material to topsoil the disturbed areas to a minimum depth of approximately 10 inches. A comparison of the reclamation alternatives is provided in Table 3.4-1.

Stockpiling of topsoil material would be required under Reclamation Alternatives B and C; however, where feasible, direct hauling of topsoil is recommended. Direct hauling, particularly in the leach residue dump area, would minimize handling time and costs related to topsoil salvage and application. Direct hauling would entail stripping topsoil from an area to be disturbed in a given year and directly applying this material to the previous year's disturbance. This eliminates the topsoil stockpile and reseeding of the stockpile area.

The shaping of steep slopes of waste storage areas to slopes of 18° or less should be an on-going process during mining operations. Contouring would stabilize the steeper slopes and promote direct hauling of topsoil (i.e., topsoil would be stripped and hauled directly to the areas where contouring was completed). This shaping/topsoiling combination would apply to the leach residue dump area (Alternatives B and C) and to the waste disposal areas (Alternative C).

For Reclamation Alternatives B and C, reclamation would be undertaken concurrently with the mining operation to the extent possible. Waste rock dumps would be reclaimed once their use for waste disposal has ceased.

Revegetation would require adapted grass and shrub species. Results from the FMC/Soil Conservation Service (SCS) plot studies currently underway at the FMC Paradise Peak Project site will be instrumental in developing species mixes for the revegetation program at the Round Mountain site. The feasibility of revegetation of disturbed areas will be evaluated based on results of these plot studies in addition to feedback from BLM and SCS.

The long-term impacts to soils, following mine abandonment, depend on the reclamation alternative eventually implemented. Under Reclamation Alternative A, topsoil would not be salvaged and revegetation would rely on natural reinvasion. Soil resources would be

TABLE 3.4-1

RECLAMATION ALTERNATIVES SUMMARY

Activities	Alternative A	Alternative B	Alternative C
Removal of all surface facilities after mining	Yes	Yes	Yes
Removal or burial of Foundations	No	No	Yes
Onsite roads ripped	Yes	Yes	Yes
Safety bench design for steep slopes of mine pit and waste dump areas (includes leach residue pile)	Yes	Mine pit only	Yes (except for leach residue pile to be shaped)
Reduction of steep slopes of all waste storage areas to 18° or less	No	Yes (leach residue pile only)	Yes (leach residue pile and waste dump areas)
Salvage suitable topsoil and reapply to minimum depth of 10"	No	Yes (remove 12" depth from leach residue pile and leach pad area)	Yes (remove up to 24" depths available from all disturbed areas except mine pit)
Revegetate (reseed) with adapted grass and shrub species	No	Yes (leach residue pile and leach pad area	Yes (all disturbed areas except mine pit)

buried under waste dumps, processing, and support facilities. Exposed areas would be subjected to erosive forces that would hamper natural plant invasion and stabilization. Rill and gully erosion would be expected on steeper sideslopes of the mine and waste disposal areas. Wider, flatter areas would be subject to wind erosion. The end result would likely be accelerated erosion (in comparison to undisturbed areas) and, at best, slow vegetation establishment.

Under Reclamation Alternatives B and C, long-term impacts associated with the erosion of soil or exposed subsurface materials would be reduced. Topsoil salvage and reapplication to provide a seed source, seedbed, and water-holding capacity, combined with reseeding of disturbed areas, would increase revegetation potential and promote long-term stabilization of treated areas. Under Alternative B, the leach residue dump and leach pad area would be revegetated. Under Alternative C, all disturbed areas but the mine pit would be revegetated.

3.5 Vegetation

Proposed Action

Impacts associated with the proposed expansion of the SVCO include vegetation removal and loss or reduction of plant productivity.

A total of approximately 2,332 acres would be affected by construction activities associated with the proposed mine expansion (e.g., mine, processing facilities, waste storage, miscellaneous support). The majority of the disturbance would occur in the greasewood and shadscale vegetation types which dominate the project area (Table 3.5-1). The majority of the disturbance to the rabbitbrush and black sagebrush types would occur south of the mine area. Construction impacts to the fourwing saltbush type would be restricted to a portion of the proposed leach residue dump.

Assuming vegetation would be removed from the proposed areas of construction, total production losses would range from approximately 467,700 to 813,600 pounds of air-dry herbage each year for the 15-year life of the project. This range corresponds to normal and good

TABLE 3.5-1

ACRES OF VEGETATION IMPACTED BY THE SVCO EXPANSION

Vegetation Type	Acres[1]	Relative Percent
Greasewood	888	38
Shadscale	766	33
Black Sagebrush	315	13
Fourwing Saltbush	206	9
Rabbitbrush	131	6
Disturbed	26	1
TOTAL	2,332	100

Source: ERT.

[1] Acreage total does not include impacts associated with water supply, electrical power, and new community development.

production years, respectively. A total of 149 animal unit months (AUMS)/year is the estimated productivity loss associated with the proposed mine expansion. This AUM loss is equivalent to the production requirements of 12 cows/year which is minimal when compared to the total number of animals that graze the allotment (Oyler 1987).

Impacts to threatened and endangered federal or state listed or federal candidate plant species are not expected to occur as a result of mine expansion.

Air emissions were examined to assess potential vegetation impacts. Fugitive dust from mining operations would occur (Section 3.1); however, damage to vegetation is not expected. Dust deposition should pose only minor impacts since the effects would be highly localized.

Vegetation removal and associated productivity losses would be cumulative over the 15-year operations period for the project. After operations cease, vegetative cover and productivity may gradually be restored on disturbed areas, depending on the reclamation alternative selected.

No Action Alternative

The vegetation loss associated with the proposed expansion (approximately 2,332 acres) would not occur with the No Action Alternative.

Mining and Processing Alternatives

The alternative leach residue pile location would impact approximately 675 acres of the shadscale vegetation type compared to the proposed location of the leach residue dump which would impact approximately 700 acres of the greasewood, shadscale, and fourwing saltbush types. Production losses associated with this alternative would range from 140,000 to 210,000 pounds of air-dry herbage per year for the 15-year life of the mine.

Reclamation Alternatives

Under Reclamation Alternative A, revegetation would rely on natural reinvasion from surrounding areas. Based on examination of existing disturbed areas in the project vicinity, natural reinvasion would not be expected to approach pre-disturbance cover levels for a long time, probably 10 years or longer. This time frame could be much longer on steep slopes and large surface areas. Effectively, Reclamation Alternative A would not likely promote a return to the existing use of the land. There are, however, abundant similar land resources in the region.

Reclamation Alternatives B and C would be more likely to promote post-mining land uses of rangeland and wildlife habitat. Storage and reapplication of topsoil to provide a seedbed and water-holding capacity, combined with active efforts to reseed disturbed areas, should increase the probability and rate of vegetative reestablishment. Under Alternative B, suitable topsoil would be salvaged for future reapplication and reseeding for the leach residue dump and leach pad area. Under Alternative C, topsoil salvage and revegetation would be attempted on all areas except the mine pit; remaining areas could potentially be restored to productive wildlife habitat and rangeland. Additional impacts to vegetation would occur at selected topsoil stockpile areas for Reclamation Alternatives B and C. These Reclamation Alternatives are discussed in more detail in Section 3.4.

3.6 Wildlife

Proposed Action

The various aspects of construction and operation of the SVCO expansion were evaluated in consideration of big game crucial habitat, such as wintering range; important chukar and sage grouse habitat; raptor nesting habitat and raptor nest locations; and habitat for other wildlife groups. Overall, the project would affect local populations of small mammals, songbirds, and reptiles; no major impacts to important species or regional wildlife populations would be expected.

Mining with the associated waste rock disposal areas and construction and operation of the heap leach facilities and solution ponds would result in the direct physical disturbance of approximately 2,332 acres of vegetation and wildlife habitat (see Section 3.5, Vegetation). The types affected would be greasewood, shadscale, black sagebrush, fourwing saltbush, and rabbitbrush. These habitats and the small mammal, reptile, and songbird species they support are typical of the intermountain basins of central Nevada. While perhaps avoiding direct destruction during construction, the loss of prey species would affect small numbers of local predators such as coyote, badger, and kit fox, and raptors such as the prairie falcon and red-tailed hawk. The area of potential disturbance is small relative to the hunting range of these species. Habitat losses would be for the life of the project and longer depending upon selected reclamation practices and procedures.

Important big game use areas are well away from the project site. The mule deer is known to occur in the area, but use is sporadic and impacts of habitat loss to the species would be minimal. Similarly, the project would not directly disturb pronghorn or bighorn sheep range. The area is classified as potential pronghorn range and that potential for the disturbed area would be lost for the life of the project and longer.

The project would reduce available habitat for chukar and sage grouse but significant effects to local populations are not expected. No known raptor nest sites would be impacted although there would be a reduction in prey base for raptors such as the prairie falcon, red-tailed hawk, and kestrel currently using the site and environs.

Waterfowl are not common in the area due to the lack of available surface water, however, waterfowl migrate through the Big Smoky Valley and use the lakes north of the project site near Carver's. There is concern that although solution ponds associated with the heap leach operation are generally small and not attractive to wildlife and the cyanide solution is diluted (0.05 percent), any open water may attract waterfowl and result in mortality from the cyanide. There are two ponds planned for the SVCO expansion with approximate dimensions of 500 by 350 feet and 250 by 250 feet. These ponds will be fenced and completely lined. Even given the relatively small size, some waterfowl kills and perhaps deaths of other wildlife species will undoubtedly occur. Mortality will be monitored under conditions of the Nevada Department of Wildlife's Modification of Wildlife Habitat Permit required by the project. If significant impacts are found, mitigation in the form of hazing, netting, or other approaches may be necessary.

In addition to the direct impacts of mortality or habitat loss, potential indirect wildlife impacts include the effects of a 10 to 20 percent increase in human activity in the area. The project would generate increased traffic, noise, and consumptive uses of wildlife, resulting in increases in wildlife road kills, legal and illegal hunting and shooting, harassment, and other disturbance. Concerns of these impacts are highest where construction workers camp on public lands. For the proposed project, workers would be expected to use RV sites at the company's Christensen Ranch and at other locations (see Section 3.10 for a discussion of worker numbers and associated population increases).

Project Alternatives

The No Action Alternative would have essentially no impact on wildlife. The impact of one additional year of operations on wildlife habitat in the project area would be minimal.

The wildlife impacts associated with the mining and processing alternatives would be similar to the Proposed Action. The implementation of Reclamation Alternatives B or C would encourage the use of the area for rangeland and wildlife habitat following project abandonment.

3.7 Land Use and Recreation

3.7.1 Land Use

Proposed Action

The proposed expansion of the SVCO would occur on private and BLM administered public lands. Private lands include the Christensen Ranch property, targeted for new employee housing, and a portion of the mine facilities site originally acquired by patents of mining claims. Public lands that would be affected are included in mining and millsite claims controlled by RMGC under 43 CFR 3809, General Mining Laws. Under the proposed expansion, public land surface disturbance would increase by approximately 2,250 acres to a total of 3,468 acres.

Most of the land proposed for new disturbance has historically been used for cattle grazing. The total 2,250-acre new disturbance represents approximately 149 AUMs/year at grazing rates common for the area. This acreage disturbance would represent a loss of approximately 2 percent of the total available acreage on the federal Big Smoky grazing allotment. This degree of reduction in grazing would not be a significant loss for the permitees.

Approximately 480 acres of farmland would be converted to community land use as a result of the new employee housing development at the Christensen Ranch property. The new village would impact the Francisco allotment which has two permittees. Although this property is not a part of the allotment, livestock have had access to portions of the area. There would be no loss of AUMs, but with a new community and its associated development, livestock harassment and road kills are potential impacts. Fencing the new village access roads and airstrip are recommended to mitigate these impacts (see Section 3.12.5).

The proposed expansion would be consistent with Nye County and BLM plans for the area, as both favor maintenance and encouragement of existing uses. The BLM Management Framework Plan supports management activities favorable to expansion needs of the community of Round Mountain. Although the proposed project anticipates the housing of new employees and the relocation of some existing SVCO employees to the Christensen Ranch property, rather than expansion of the existing townsite, it is not inconsistent with the apparent intent of maintaining and improving the viability of the community. From a land use planning perspective, the development of the new employee housing development, as proposed, would represent a qualitative improvement over the existing community. (This improvement would not be without tradeoffs in other areas as noted in Section 3.10, Socioeconomics.)

Neither the new electric substation nor the relocated transmission line are expected to pose a public safety hazard. Both of these facilities will be built in compliance with the National Electrical Safety Code. This will include main minimum ground clearance below the conductors, both in open country and at road crossings. The substation will be fenced to inhibit public entry.

No Action Alternative

The No Action Alternative would result in no change to land use through closure and dismantling of the SVCO. At that time, the community of Round Mountain would lose a substantial portion of its population and the long-term viability of the community would be questionable. The land disturbance represented by the SVCO would continue indefinitely.

Mining and Processing Alternatives

Mining and processing alternatives would not substantively affect land use effects of the proposed SVCO expansion.

Employee Housing Alternatives

New Employee Transportation to and from Tonopah. This alternative would result in only minor land use changes at the Christensen Ranch property. Disturbance at the mine/plant site would occur as described for the Proposed Action. There is also potential for conversion of land in the Tonopah area to urban uses, depending on the availability of existing housing to accommodate RMGC employees. None of these effects would be considered significant.

Round Mountain Townsite Expansion. This alternative would tend to disperse the residential development effects of the SVCO expansion, as compared with other alternatives. Presumably, most would locate in the Carver's vicinity or in the existing community of Round Mountain. Development of 29 homesites on the Christensen Ranch property would be less efficient than a larger development in terms of provision of community facilities and access to services. Although not favored from a land use perspective, this alternative would not generate significant adverse effects.

Reclamation Alternatives

Under Reclamation Alternative A, all lands disturbed by SVCO mine/plant site activities would be subject to very slow natural revegetation and, for practical purposes, would be permanently lost for post-mining productive use. Under Reclamation Alternative B, the mine pit, waste dump, and plant site areas would be essentially lost for post-mining productive use. The leach pad and leach residue area would become productive for grazing or wildlife forage if the revegetation is successful. Reclamation Alternative C would result in effective loss from productive reuse of only the mine pit. All other areas would become productive for grazing or wildlife forage to the degree that the revegetation effort succeeded.

3.7.2 Recreation

Proposed Action

Outdoor recreational resources including dispersed recreation, hunting, fishing, and sightseeing would not be adversely affected by the proposed expansion because the minesite contains no unique or important recreation areas and because permanent population increases would be relatively small. The region has abundant acreages of public open space lands. No existing or proposed wilderness areas would be affected.

Based on a permanent increase in population of 192, with the majority (95 percent) locating at the new village and in other areas within the Big Smoky Valley, an increase in demand on local community recreational facilities and programs within the Big Smoky Valley is expected.

Several recreational facilities are proposed for the new village including a pool, golf course, tennis courts, a park, ballfields, and a community activity center. These facilities would greatly enhance the quality of life for residents throughout the Big Smoky Valley considering the limited urban recreational opportunities available today.

If recreational facilities are not provided at the new village, the existing programs and facilities in Round Mountain would not be adequate for the new population, and significant recreational impacts would occur.

No Action Alternative

The No Action Alternative would not affect recreational resources in the study area. Community recreational demands would decline due to a reduction in the Round Mountain population following project abandonment. Public expenditures for recreational programs, facilities, and resource management would decrease.

Employee Housing Alternatives

Round Mountain Townsite Expansion Alternative. The Round Mountain townsite expansion alternative would impact the area of community recreation during construction and operations. Round Mountain currently has inadequate facilities and programs to serve the existing population. With increased population in Round Mountain and other areas of the Big Smoky Valley, additional recreational programming and facilities would be required within the townsite. A new park, with picnic facilities and playground equipment, and a swimming pool would be important improvements necessary to serve the existing and new population. In addition, organized recreational programs should be instituted.

New Employee Transportation to and from Tonopah. The Tonopah transportation alternative would impact the area of community recreation during construction and operations. Currently, Tonopah has inadequate public facilities and programs to serve the existing population. With the increased population in Tonopah associated with the expansion, this situation would worsen. Additional recreation facilities and junior and adult programs would be required to meet recreation demands of the existing population and mine-related population.

3.8 Cultural Resources

Proposed Action

The sites presently considered potentially eligible for nomination to the National Register of Historic Places (NRHP) include 433-88 and CRNV-61-2182, two historic pipelines; and a complex of structural features and trash remains designated as site 433-98. Under the proposed expansion, these sites could be directly affected by mining operations. The site designated 433-88 is a large, spiral round and riveted metal pipeline. This is apparently the line established to provide water from Shoshone Creek to the Round Mountain townsite in 1908. Site CRNV-61-2182 is the Jett Canyon pipeline, a riveted metal pipeline constructed in 1915. Site 433-98 and associated site loci are a complex of structural remains and trash debris including industrial and domestic locations. This site is referred to as the Fairview mine complex. Some disturbance has occurred as a result of heavy machinery operation and probably unauthorized artifact collecting. Situated in close proximity to the present Round Mountain townsite, the 433-98 complex may still provide some of the best archaeological information about the town's early inhabitants. For the balance of the cultural resource locations, none is recommended as significant or eligible for nomination to the NRHP and no further work is recommended.

One site (433-156) on the edge of the Round Mountain townsite, recommended as potentially eligible for nomination to the NRHP, may be subject to indirect impacts. This site is composed of structures and a low-density trash scatter that may have been used by the Western Shoshone Indians.

The Round Mountain townsite is not recommended as eligible for nomination to the NRHP. The primary factor is the lack of integrity in the archaeological remains from extensive ground disturbance; therefore, the townsite is not likely to yield significant archaeological information.

The buildings within the townsite of Round Mountain were evaluated for eligibility to the NRHP, individually and as a district, based on their architectural significance. The William H. Berg House with the bottle root cellar and ice house is presently listed on the NRHP. All of the buildings on patented land which were previously considered potentially eligible as part of a Stebbins Hill Historic District (Janus Associates 1980) have been demolished. The 1980 inventory also suggested that the Round Mountain School would become eligible in 1987 when it is 50 years old; the 1987 evaluation by Rainshadow Associates concluded that the school is not eligible under any of the four National Register criteria.

It has been suggested that the present Berg nomination could perhaps be expanded from the present William H. Berg House with root cellar and ice house (RM-101) to include other buildings associated with the four Berg brothers who came to Round Mountain from Alaska in 1906 and whose descendants have since played a major role in the life of the town and the Big Smoky Valley. This thematic nomination would meet criteria B: "that are associated with the lives of persons significant in our past" as the Bergs are significant to Round Mountain. If such a nomination were to be pursued, a great deal of additional research would have to be completed before such eligibility could be determined. It is questionable at this time whether these structures merit such as effort. The buildings in question are the C. L. Shuppy House built by Jack W. Berg in 1908 (RM-102), the J. W. Berg House built by Jack W. Berg circa 1908 (RM-103), the Berg Garage built circa 1928 to house Jack Berg's Ford Automobile Agency, repair shop, and gasoline station (RM-104), and the Round Mountain Post Office which was moved to Round Mountain in 1908 and housed the post office and Jack Berg's restaurant among other uses (RM-107).

There is insufficient building stock remaining in Round Mountain with sufficient integrity to merit nomination as a district to the NRHP. No other individual buildings in Round Mountain are considered eligible to the National Register. Many of the buildings in the present inventory lack the integrity to be considered individually, as part of a district, or as part of a thematic nomination.

The future of the historic buildings within the townsite is dependent on the question of property ownership, which has not legally been resolved. The potential reuse and rehabilitation of the historic buildings in the town is dependent on many factors including ownership.

No Action Alternative

The cultural resources in the project area are not considered likely to present any argument justifying the No Action Alternative. All adverse effects could likely be reasonably mitigated by historical research, oral history, and archaeological investigation, or some combination thereof.

Mining and Processing Alternatives

Of these alternatives, only development of the alternative leach residue pile would present any immediate problems. Any such development would have to be preceded by a Class III cultural resource inventory. Based on previous investigations just north of this area, significant remains are not believed likely to occur; however, an inventory is intended to ascertain that fact.

3.9 Aesthetics

3.9.1 Visual Resources

Proposed Action

Visual impacts caused by the proposed SVCO expansion were analyzed using the procedures outlined in the BLM Visual Resource Contrast Rating Handbook (BLM 1986). Visual impact significance was determined by comparing visual contrast ratings for the proposed mine facilities with visual resource management (VRM) class objectives for the respective management class affected (Table 2.9-1). Although the site area is classified as a rehabilitation area, it was assumed for this analysis that the appropriate objective would be the Class IV objective because the most similar surrounding area is designated VRM Class IV. Designation as a visual rehabilitation area indicates that the area should be managed to improve the existing visual condition.

Visual contrast analyses were conducted from three "key observation points" (KOPs): (1) approximately 5 miles southwest of Round Mountain on State Highway (S.H.) 376, representing travelers approaching from the south; (2) the intersection of the SVCO access road with S.H. 376, representing the nearest point at which the general public approaches the site; and (3) approximately 5 miles northwest of Round Mountain on S.H. 376, representing travelers approaching from the north and residents in the Carver's community.

Development of the proposed SVCO expansion would result in a significant increase in visual contrast in the site area. The existing operation exhibits strong contrast in terms of color and line and moderate to strong contrast in terms of land form and surface texture. The position of the existing operation more than a mile from the nearest public viewpoint and backed up against the Toquima Mountain Range mitigates the visual impact somewhat, but the existing contrast is strong enough to warrant a "rehabilitation area" visual management rating. The proposed expansion would notably increase the apparent scale of the SVCO, particularly by locating the proposed leach residue dump area within 1,200 feet of S.H. 376, the main road through the Big Smoky Valley. The proposed leach residue dump would nearly double the field-of-view covered by the SVCO from all three KOPs. More importantly, the 100-foot or greater height above the roadway level would obliterate views of the Toquima Range of mountains for at least 2 miles along the highway frontage. Consequently, the proposed expansion would result in strong and notably increased form, line, color, and texture contrast with the characteristic landscape in the project area. This degree of contrast is considered significant, even for an area with a VRM Class IV rating. For mitigating considerations, refer to the Mining and Processing Alternatives and Reclamation Alternatives discussions below.

No Action Alternative

The No Action Alternative would have essentially no effect on existing visual resources. The visual change from one additional year of operation would not be apparent to most observers. Presumably, the existing contrast would continue indefinitely with little or no reclamation of existing waste rock and leach residue dumps.

Mining and Processing Alternatives

The conveyor transport and in-pit crushing alternatives would have no apparent effect on visual resource impacts.

The alternative leach residue pile location would increase the visual contrast of the existing SVCO slightly by extending its length approximately 2 miles south. The visual contrast would continue to be moderate to strong but the apparent scale would be notably reduced compared with the apparent scale of the proposed SVCO leach residue pile closer to the highway because of the greater distance from viewers and because the mountain backdrop would be proportionally much more visually dominant. Visual impacts from this alternative would be significant because they would expand the extant visual contrast in an area designated for rehabilitation. The impacts of the alternative leach residue pile location would be notably less severe than the impacts from the proposed residue dump location, however. For mitigating considerations, refer to the Reclamation Alternatives discussion below.

Employee Housing Alternatives

Both employee housing alternatives would reduce the visual intrusion compared to development of the Christensen Ranch property. They do not provide significant visual resource advantages, however, because development of the ranch would not result in significant adverse visual impacts.

Reclamation Alternatives

Alternative A would result in continuation of significant visual contrast indefinitely because natural revegetation on the crushed rock surfaces of waste rock and leach residue dumps in the harsh southern Nevada climate would take many decades, at best.

Alternative B would result in reduction in long-term visual effects of the SVCO expansion. The visual effects would remain significant, however, because of the strong landform contrast of the leach residue pile.

If combined with the alternative leach residue pile location. Alternative B would result in a notable reduction in the long-term visual effects of the expansion. Successful revegetation of the proposed leach pad and alternative leach residue pile would greatly reduce the color contrast of these major project features with concomitant reductions in line and texture contrasts. It is assumed that steep side slopes of the residue dumps would be reduced to a less extreme angle of 18° or less in order to accomplish revegetation. This would also reduce land form contrast. The ultimate result would be no significant long-term visual effects from the SVCO expansion.

Alternative B applied to the proposed leach residue pile would reduce the long-term visual effects of the SVCO expansion, though not as dramatically as Reclamation Alternatives B or C combined with the alternative leach residue pile location. Reduction of the residue dump side slopes to 18° or less would reduce the visual effect along S.H. 376 and would reduce the land form contrast. Revegetating the slopes with native plant materials would substantially reduce color and texture contrasts, which would also result in reduced line contrast. The leach residue pile would still dominate the view from the KOPs and would block views of the Toquima Mountain Range from the KOP number 2 vicinity, but over the long term, the VRM Class IV objective would be met, and the visual impact would be reduced to not significant.

Alternative C would result in visual effects to the SVCO area similar to those described for Alternative B but to a lesser degree, commensurate with the higher level of effort applied. Alternative C would result in the greatest degree of visual rehabilitation that could be expected without addressing existing ore and rock dumps at the SVCO.

3.9.2 Noise

Proposed Action

Major sources of noise from expansion of the SVCO would be the same as those currently in operation: rock drilling, blasting, loading of rock and ore, truck hauling, ore crushing, and crushed ore handling and distribution. The same types of equipment currently is use would continue to be used but there would be more machines in operation.

Maximum total noise emissions were estimated for the expanded project using the equipment roster listed in Table 3.9-1. Assuming all the equipment were operating simultaneously, the total noise emission level would be approximately 110 decibels, A-weighted (dBA). A sound pressure level of 110 dBA would be reduced to 64.7 dBA at the edge of the existing community of Round Mountain (1.75 miles), calculating only noise attenuation from spreading of sound waves over distance. Because 65 dBA is an acceptable exterior peak noise level at a residential area, no further calculations were performed. Substantial additional noise reduction would be expected, however, from barrier effects of the large existing leached ore dump and Round Mountain itself. Also, noise emissions at the peak level would not be common because equipment is not typically operated at maximum speed throughout a shift, and all equipment would not typically be operated simultaneously. The assumptions employed in the noise analysis are, therefore, considered to be very conservative.

Noise levels from the SVCO expansion would be lower at the Christensen Ranch residential development than at the Round Mountain townsite. Using the same conservative assumptions noted above, SVCO-related noise at the new village site (3.5 miles away) would be reduced to 58.7 dBA.

TABLE 3.9-1

SVCO MAJOR NOISE SOURCES

Noise Source	Existing	Proposed	Total	Noise Emission Level per Unit (dBA)
Blast Hole Drills	3	2	5	98
Hydraulic Excavators	3	2	5	90
Haul Trucks	6	15	21	90
Miscellaneous Trucks	7	2	9	85
Dozers, Loaders, Scrapers	5	9	14	87
Crushers	NA	NA	8	95

Sources: EPA 1971, CERL 1978, ERT file data.

Noise and vibration from blasting would continue at approximately the same magnitude under the proposed SVCO expansion, although there would be an increase in the frequency of blasting with additional working benches in operation in the mine.

In summary, noise levels would increase slightly from the proposed expansion of the SVCO, but neither the increase nor the total noise levels would be significant at the nearest sensitive receptors.

No Action Alternative

The No Action Alternative would result in continuing noise emissions at current levels from the SVCO through closure. After dismantling, all SVCO-related noise emissions would cease. Current noise emissions are not considered to be significantly adverse, so the noise reduction would not be significant.

Mining and Processing Alternatives

Both the conveyor transport alternative and the in-pit crushing alternative involve use of conveyors in place of trucks to move ore and waste rock. Use of conveyors would reduce noise emissions somewhat compared with trucks, but the difference would not be significant at sensitive receptors.

The alternative leach residue pile location would not substantively affect noise.

Employee Housing Alternatives

Employee housing alternatives would not substantively alter noise effects from the proposed expansion of the SVCO.

Reclamation Alternatives

Reclamation alternatives would not substantively alter noise effects from the proposed expansion of the SVCO.

3.10 Socioeconomics

This section evaluates the beneficial and adverse effects of the proposed SVCO expansion within the context of cumulative social and economic changes in the study area. The project-related impacts, both temporary and permanent, cannot be treated in isolation, but must be related to changes in the overall economic picture of the area, including the uncertainty associated with future U.S. Air Force and military activities and increased mining exploration and development throughout the area. Cumulative effects may compound or offset one another, and these effects may vary through different phases of development. The impact assessment presented here is based on the most current available information as of March 1987; future changes in employment and phasing of other projects may result in changes to the cumulative impacts presented.

Calculations of impacts were based on known characteristics of the study area, supported by professional planning standards, and empirical data from other mining projects in Nevada. Tables 3.10-1, 3.10-2, and 3.10-3 reflect all projections of impacts from the expansion of the mine during average and peak construction and operation.

Proposed Project

3.10.1 Population

The Nye County population has increased over the period from 1980 to 1986 with a net change of 65.5 percent. The 1986 population is estimated at 14,970, an average annual increase of 8.8 percent since 1980. This trend is projected to slow somewhat with total population reaching 17,314 by 1990. The expected growth in population is due to anticipated increases in military activity and increases in mining activity in the northern part of the county and service industry expansion in the south. Tonopah, however, experienced a decline in population in 1984 due to closing of the Anaconda mine. It appears that population will again increase as mining expands and Air Force activities continue.

Construction for the SVCO expansion is scheduled to begin in June 1987 and continue until completion in December 1988 with peak periods projected to occur during March through August 1988. The greatest population impact on Nye County would occur during this period.

TABLE 3.10-1

PROPOSED PROJECT

SVCO EXPANSION

PROJECTIONS OF EMPLOYMENT, POPULATION, HOUSING, AND SCHOOL AGE CHILDREN BY LOCATION

CONSTRUCTION PHASE (1988) AVERAGE[1]

	Local[2] Direct	Non-Local[2] Direct	Total Direct	Local Indirect	Non-Local Indirect	Total[3] Indirect	Total
NEW EMPLOYMENT	28	255	283	31	20	51	334
NEW HOUSEHOLDS[4]							
Single		204			8		212
Married (1 Worker)		28			2		30
Married (2 Workers)		12			1		13
TOTAL		244			11		255

Location	Tonopah	New Village	Big Smoky Valley	Total
NEW HOUSEHOLDS[5]	13	191	51	255
NEW POPULATION[6]				
Single Household	11	165	44	220
Married Household	7	111	30	148
TOTAL	18	276	74	368
NEW SCHOOL CHILDREN[7]				
Secondary	1	10	2	13
Primary	3	38	8	49
TOTAL	4	48	10	62
HOUSING PREFERENCE[8]				
Single Family	1	0	0	1
Multi Family	2	0	0	2
Mobile Homes	2	14	31	47
Other (RV or Motel)	8	177	20	205
TOTAL[9]	13	191	51	255

TABLE 3.10-1 (CONTINUED)

Footnotes:

[1] The average construction workforce is 283 over the 18-month construction period. The peak workforce of 462 will occur for 3 months starting in March 1988.

[2] The construction workforce is assumed to be 10 percent local, 90 percent non-local (BLM 1980). Local workers will commute to and from their place of residence to work on a daily basis (McMyler Kaiser Engineering 1987).

[3] Indirect construction employment is calculated using a construction employment multiplier of 1.2 based on 1978 employment location quotients and basic/nonbasic employment. It is assumed that 70 percent of the indirect labor force are second persons in the direct labor households (ERT 1980).

[4] The construction workforce is composed of 80 percent single workers or married without family, and 20 percent married workers with family (McMyler Kaiser Engineering 1987; ERT 1987).

[5] While the new village is being developed, and limited R.V. facilities are available, 30 percent of the construction workforce will locate in Tonopah, 50 percent at the new village, and 20 percent in other areas of the Smoky Valley, specifically near Carver's. In 1988 when the entire R.V. park is functional, only 5 percent of the workforce are expected to reside in Tonopah, 75 percent at the new village, and 20 percent in Big Smoky Valley.

[6] Population estimates are based on one person per household for single households for direct workers, 2 person per household for indirect workers, and 3.5 persons per household for married households (BLM 1980).

[7] Eighty percent of school-age children are primary students, 20 percent secondary students (BLM 1980).

[8] Housing preferences are shown based on the following percentage distribution.

	Tonopah	New Village	Big Smoky Valley
Single Family (SF)	5%	--	--
Multi Family (MF)	20%	--	--
Mobile Home (MH)	15%	7%	60%
Other (RV site or motel)	60%	93%	40%

[9] Totals on tables may not add up due to rounding errors.

TABLE 3.10-2

PROPOSED PROJECT

SVCO EXPANSION

PROJECTIONS OF EMPLOYMENT, POPULATION, HOUSING, AND SCHOOL AGE CHILDREN BY LOCATION

CONSTRUCTION PHASE (1988) PEAK[1]

	Local[2] Direct	Non-Local[2] Direct	Total Direct	Local Indirect	Non-Local Indirect	Total[3] Indirect	Total
NEW EMPLOYMENT	46	416	462	50	33	83	545
NEW HOUSEHOLDS[4]							
Single		333			12		346
Married (1 Worker)		45			4		48
Married (2 Workers)		19			2		21
TOTAL		397			18		415

Location	Tonopah	New Village	Big Smoky Valley	Total
NEW HOUSEHOLDS[5]	125	228	62	415
NEW POPULATION[6]				
Single Household	108	198	54	360
Married Household	73	133	36	242
TOTAL	181	331	90	602
NEW SCHOOL CHILDREN[7]				
Secondary	6	11	3	20
Primary	25	46	12	83
TOTAL	31	57	15	103
HOUSING PREFERENCE[8]				
Single Family	6	0	0	6
Multi Family	25	0	0	25
Mobile Homes	19	16	37	72
Other (RV or Motel)	75	212	25	312
TOTAL[9]	125	228	62	415

TABLE 3.10-2 (CONTINUED)

Footnotes:

[1] The average construction workforce is 283 over the 18 month construction period. The peak workforce of 462 will occur for 3 months starting in March 1988.

[2] The construction workforce is assumed to be 10 percent local, 90 percent non-local (BLM 1980). Local workers will commute to and from their place of residence to work on a daily basis (McMyler Kaiser Engineering 1987).

[3] Indirect construction employment is calculated using a construction employment multiplier of 1.2 based on 1978 employment location quotients and basic/nonbasic employment. It is assumed that 70 percent of the indirect labor force are second persons in the direct labor households (ERT 1980).

[4] The construction workforce is composed of 80 percent single workers or married without family, and 20 percent married workers with family (McMyler, Kaiser Engineering 1987; ERT 1987).

[5] While the new village is being developed, and limited R.V. facilities are available, 30 percent of the construction workforce will locate in Tonopah, 50 percent at the new village, and 20 percent in other areas of the Smoky Valley, specifically near Carver's. In 1988 when the entire R.V. park is functional, only 5 percent of the workforce are expected to reside in Tonopah, 75 percent at the new townsite and 20 percent in Smoky Valley. During peak construction in early 1988, 30 percent are expected to locate in Tonopah, 55 percent at the new village, and 15 percent in the Big Smoky Valley.

[6] Population estimates are based on one person per household for single households with direct workers, 2 persons per household for single households with indirect workers, and 3.5 persons per household for married households (BLM 1980).

[7] Eighty percent of school age children are primary students, 20 percent secondary students (BLM 1980).

[8] Housing preferences are shown based on the following percentage distribution.

	Tonopah	New Village	Big Smoky Valley
Single Family (SF)	5%	--	--
Multi Family (MF)	20%	--	--
Mobile Home (MH)	15%	7%	60%
Other (RV site or motel)	60%	93%	40%

[9] Totals on tables may not add up due to rounding errors.

TABLE 3.10-3

PROPOSED PROJECT
SVCO EXPANSION
PROJECTIONS OF EMPLOYMENT, POPULATION, HOUSING, AND SCHOOL AGE CHILDREN BY LOCATION
OPERATIONS PHASE[1]

	Local[2] Direct	Non-Local[2] Direct	Total Direct	Local Indirect	Non-Local Indirect	Total[3] Indirect	Total
NEW EMPLOYMENT	4	67	71	22	15	37	108
NEW HOUSEHOLDS[4]							
Single		17			4		21
Married (1 Worker)		27			6		33
Married (2 Workers)		11			2		13
TOTAL		55			12		67

Location	Tonopah	New Village	Big Smoky Valley	Total
NEW HOUSEHOLDS[5]	3	57	7	67
NEW POPULATION[6]				
Single Household	1	18	2	21
Married Household	8	138	16	162
TOTAL	9	156	18	183
NEW SCHOOL CHILDREN[7]				
Secondary	1	14	2	17
Primary	3	55	6	64
TOTAL	4	69	8	81
HOUSING PREFERENCE[8]				
Single Family	2	54	1	57
Multi Family	1	3	0	4
Mobile Homes	1	0	5	6
Other (RV or Motel)	0	0	0	0
TOTAL[9]	4	57	6	67

TABLE 3.10-3 (CONTINUED)

Footnotes:

[1] The new operations workforce is assumed to be 5 percent local and 95 percent inmigrants.

[2] Indirect operations employment is calculated using an operations employment multiplier of 1.55 (Nevada Bureau of Mines and Geology 1982). It is assumed that 70 percent of the indirect labor force are second persons in the direct labor households.

[3] The construction workforce is composed of 26 percent single workers and 74 percent married workers (Stonier 1987).

[4] During operations it is assumed that 80 percent of the new employees would live at the new village, 15 percent in the Big Smoky Valley, and 5 percent in Tonopah.

[5] Population estimates are based on one person per household for single households and 3.5 persons per household for married households.

[6] Eighty percent of school-age children are primary students, 20 percent secondary students.

[7] Housing preferences shown are based on the following percentage distribution.

	Tonopah	New Village	Big Smoky Valley
Single Family (SF)	67%	95%	15%
Multi Family (MF)	33%	5%	--
Mobile Home (MH)	--	--	--
Other (RV site or motel)	--	--	85%

[8] Totals on tables may not add up due to rounding errors.

The peak construction workforce is estimated at 462 workers. Peak population is estimated at a maximum of 602 people in March 1988. This population level would remain relatively stable for three months and then start to decline. There would be overlapping population impacts from construction workers and operation workers locating in the area.

The effect of the expansion on the area population depends largely on the number of inmigrating workers and demographic characteristics of their families. As illustrated in Tables 3.10-1 and 3.10-2, the average increase in population in the area from the project is projected to be 368 persons during construction in 1988 and 183 persons during operations from 1988 through 2002 or beyond.

This population increase represents moderate growth to area population during construction. The average population increase during the period would be 8.2 percent of the 1985 base population in Tonopah and the Big Smoky Valley. The population increase from operations for the area would be 4.1 percent of the 1985 base population. These rates of increase are not unusual relative to past rates of population growth. From 1980 to 1985, the study area averaged an annual growth of 12.1 percent.

Anticipated population increases resulting from the SVCO expansion are summarized on Tables 3.10-1, 3.10-2, and 3.10-3. These tables represent impacts related to average construction employment (283), peak construction employment (462), and operations employment (71). Population increases include direct and indirect household population.

The Tonopah population is projected to increase 110 persons during construction in the latter half of 1987, and will decline to 18 in 1988 as recreational vehicle (R.V.) sites become available at the new townsite. The estimated Tonopah population increase during operations, is 19.

The existing town of Round Mountain is not expected to increase in population from the proposed expansion. The population increase would occur at the new townsite. During construction in 1987 an average of 184 people (50 percent) are expected to locate in the new village, and in 1988, 276 people (75 percent) would locate there. During operations a total of 156 people (85 percent) would live at the new village.

Other areas throughout the Big Smoky Valley would also experience growth in population. In 1987 and 1988, an estimated additional 74 people (20 percent) would live in other parts of the Big Smoky Valley. During operations, 18 new workers (10 percent) would locate in the Big Smoky Valley. Tables 3.10-1, 3.10-2, and 3.10-3 show the allocation of construction households and operations households to communities in the area.

In summary, population increases due to the SVCO expansion would not greatly increase the area population except during peak construction employment, but the increases would have a noticeable effect.

RMGC estimates production from the SVCO expansion would end in 2002. At this time, if no additional economic activity is occurring in mining or related fields in Nye County, people directly or indirectly employed by the project would be expected to leave the area. The loss of population at project completion would be comparable to the projected population increases shown in Table 3.10-3.

3.10.2 Economy

The principal economic effects of the SVCO expansion would be an increase in mining employment in Nye County. The 70 additional permanent employees at the mine would represent a 7.9 percent increase in the estimated 1985 mining employment in Nye County and less than 1 percent increase in total county wage and salary employment. The 37 additional indirect jobs created would represent less than 1 percent increase in employment in the services and trade sectors in Nye County. Most of the economic impact would occur in the Smoky Valley area, and in Tonopah.

3.10.3 Employment

Employment impacts of the expansion are also summarized on Tables 3.10-1, 3.10-2, and 3.10-3. The greatest impact on Nye County employment from the SVCO expansion would be during the peak construction phase with an estimated total direct employment of 462. Total indirect employment associated with peak construction is estimated at 83 new workers. This peak level would be sustained for only three months.

Based on existing state labor force and unemployment figures for Nye County, it is estimated that 10 percent (28) of the average construction employment level of 283 workers would come from in or near the study area. Inmigrant labor would come primarily from other areas around the state including Reno, Carson City, Las Vegas, and Ely.

Secondary employment related to the construction of the mine complex was estimated using a construction sector multiplier of 1.2 (Isard 1976, Bureau of Economic Analysis 1980; ERT 1981). An average high of 334 direct and indirect jobs would be created during the construction phase, of which 59 are projected to be filled by local area residents.

The expansion related increase in permanent operations workforce is expected to total 70 workers, with little carryover from construction. The indirect employment generated in the service sectors during operations was estimated using an employment multiplier of 1.55 (Nevada Bureau of Mines and Geology 1982). The largest total employment increase would be in mid-1988 when construction is winding down and operations beginning. New operations workers would be phased into the existing operations workforce throughout the construction period. Once construction is completed, the total employment level is estimated at 107 new jobs with the non-local portion totaling 82.

The employment picture for the basic industries supporting the overall economic base in Nye County is unclear. In 1985, there were 47 mine operators and 1,224 miners in Nye County (Nevada Department of Industrial Relations 1986). New mining exploration and operations activities in 1986 totaled approximately 1,020 additional workers. Future levels of activity are uncertain at the Nevada Test Site, the Tonopah Test Range, and Nellis Air Force Base near Tonopah and at mining activities throughout Nye, Esmeralda, and Mineral Counties. The production status of each of the projects in the near future will determine the availability of local labor that could be hired by Round Mountain Gold Corporation.

If military expansions in Tonopah and mineral exploration in the area continue to increase at the current rate, the unemployed labor force would be absorbed more quickly, creating the need to import more non-local labor for the SVCO expansion. The numbers evaluated reflect this continued growth scenario. If military or other mining activities declined the overall non-local impact of the SVCO expansion would be less.

Overall, income should increase throughout the study area with reduced unemployment and increased economic activity during construction and operations. This is discussed in more detail in Section 3.10.4.

Losses in direct and indirect employment would result upon project completion in 2002. Total employment losses would be equal to those estimated in Table 3.10-3.

3.10.4 Fiscal Effects

Analysis of Nye County finances shows that the county is in sound financial condition. The proposed SVCO expansion would contribute a significant net revenue increase to Nye County throughout most of its projected 15-year lifespan. Revenue increases would result primarily from greater property, net proceeds, and sales tax revenues. Increasing population, however, would require greater expenditures by Nye County for the provision of services at current levels.

The SVCO is currently on the Nye County tax rolls, therefore the tax revenue estimates illustrated here reflect only the incremental increase in tax revenues from the proposed expansion. First-year expanded operations revenues will reflect full operations taxes generated, including property taxes and net proceeds taxes. The projected revenues are estimates based on current tax rates and assessment practices. Actual taxes may vary.

At the county level, the principal revenue change for Nye County would result from a major increase in assessed valuation attributable to the expanded mine, the new townsite, and other facilities. First-year property taxes for the mine and new village development are estimated on Table 3.10-4 based on capital expenditures incurred annually for project development. Real property is taxed based on a 35 percent of market value assessed valuation and 2.1931 mill tax rate. Receipt of the revenues would lag one year behind installation of improvements. Net proceeds taxes are also estimated, but may be high due to insufficient data on mine operations expenses which are deducted prior to taxation.

TABLE 3.10-4

INCREMENTAL TAX REVENUES GENERATED
ROUND MOUNTAIN GOLD MINE EXPANSION
(THOUSANDS OF DOLLARS)

Construction	1987 Expenditures	1988 Tax Increment	1988 Expenditures	1989 Tax Increment	1989 Expenditures	1990 Tax Increment
Property Tax						
Mine Construction	$24,261	$186	$110,141	$845	$4,652	$36
Village Construction	12,000	92	NA	--	18,000	138
Operations	NA	--	NA	--	36,652	281
Subtotal	36,261	278	110,141	845	59,304	455
Net Proceeds Tax	NA	--	NA	--	NA	2,462
Sales and Use Tax						1,800
TOTAL						$ 4,717

1. Taxes are estimated for incremental annual capital expenditures. Equipment and materials acquired during the construction phase are not depreciated and carried forward to the next year because sufficient detailed cost information is not available.

2. Revenues in future years will decrease due to depreciation of property and equipment.

3. No revenue is projected to be received the first year because of the lag in production and initial tax receipts.

It is assumed that the new village would be annexed into the Round Mountain taxing district. The mine currently is included in the taxing district and provides a substantial tax base from which the existing townsite of Round Mountain operates its public services and facilities.

In 1988, Nye County would receive an estimated $278,000 in taxes on labor, material, equipment, and capital assets from mine and village construction activities occurring in 1987.

In 1989, based on capital construction expenditures for 1988 at the mine, the estimated property taxes paid by RMGC would total approximately $845,000. This represents a 48 percent increase in countywide taxes. At 1986-87 tax rates, 23 percent of this total would accrue to the town of Round Mountain, 48.8 percent to the Nye County School District, 24.4 percent to Nye County, and the remainder to other special districts and the state. These taxes would directly benefit Round Mountain and Nye County.

In 1990, at projected full build out of the new village, an incremental increase of $138,000 in taxes would have accrued to Nye County from residential and commercial development at the new townsite. It is likely that other residential and commercial development would occur throughout the Big Smoky Valley increasing assessed valuations. Tax revenues have not been estimated for these developments. As shown on Table 3.10-4, there would be a 1-year lag between construction/ operations activities and initial receipt of project-related property tax revenues due to assessment and collection practice. During this period, an adverse countywide financial impact may be experienced because of increases in demands for services from population growth.

RMGC estimates property taxes at $500,000 as an average for the duration of the project.

The net proceeds tax is assessed on the production of gold and silver, at property tax rates. This tax is based on estimated mining profits, which depend on gold and silver prices in the market. Tax revenues to Nye County would range between $2.4 and 3.4 million if gold prices are in the range of $400 to $500 per ounce and silver prices range from $6 to $10 per ounce.

The SVCO expansion would generate an annual payroll of $15,756,000 during operations (1989 through 2002). Comparable figures for 1987-88 include a construction payroll of $9,240,000. A portion of this total income would be spent in the area and would result in increased sales tax receipts throughout the area.

Assuming 75 percent of these wages and salaries represent disposable income and a local spending (Nye County) capture rate of 40 percent for construction workers and 60 percent for operations employees, a total of $2,587,200 in new local spending for goods and services would occur in 1987-1988 and $6,617,520 in 1989 through the life of the project. Depending on the level of commercial development at the new village, the local spending would take place primarily in Round Mountain and Tonopah. In Nye County, 2 cents per sales dollar goes to the state, 1.5 cents to the school district; and 0.5 cents to the county in the form of "relief tax". A supplemental reserve county/city tax of 1.75 percent is distributed by the Nevada Tax Commission to counties after individual county requests are reviewed and approved. Other sales tax receipts include corporate sales tax and contractor use taxes; RMGC estimates these taxes at $1.8 million.

With the increase in population and school-age children, there will also be increases in government service and facility demands requiring county, town, and school district expenditures. Typically, government entities would experience increased expenditures with little increase in revenues during the construction phase. Increases in expenditures would occur primarily in public safety, Round Mountain area schools, welfare, and community support activities during the construction phase. There will likely be a financial shortfall for all government entities affected during this period.

The reverse is true during operations. Since the operations workforce is considerably smaller and more stable than the construction workforce, the demands on public services and facilities would not be as dramatic. Nevertheless, increases in expenditures would occur for schools, public safety, road maintenance and recreational areas. In Nye County, the relatively small increase in population from the expanded mine would be more than offset by the increased revenues from property taxes, sales taxes, and net proceeds taxes.

The effects of the new village on public services and facilities is discussed in Section 3.11.6.

In summary, it is anticipated that the Smoky Valley Common Operation expansion would result in short-term revenue shortfalls in Nye County, but would result once revenues of the project start accruing to the county taxing and service jurisdictions.

Upon project completion Nye County would experience significant reductions in ad volorem revenue from mine operations.

3.10.5 Housing

As described in Chapter 2, the existing housing market is generally very tight for lower cost and temporary housing, such as rentals and mobile homes, throughout the study area. Future prospects for a change in this situation depend on the new development of residential, multi-family rental units. Continuing uncertainty about military employment and mining activity in the region has been and will continue to be a hindrance to private development of rental housing units. Efforts by RMGC to increase the housing supply during construction through development of the Christensen Ranch property would improve the housing situation substantially.

It is assumed that 100 of the 200 temporary R.V. sites would be operational by October of 1987. The remaining 100 R.V. sites would be ready for occupancy early in 1988. If these facilities are not available, the SVCO expansion would create a much more significant impact.

The SVCO operation is expected to create a total of 255 new construction-related households by the latter part of 1987, and 67 project-related households during operations. The existing housing stock in the area, including vacancy rates, rental rates, houses for sale, and temporary accommodations is described in Chapter 2.

If the housing stock remains at the current level, construction workers would be required to commute from Tonopah, and the primary source of housing would be motels. The Tonopah Chamber of Commerce (Perchetti 1987) feels motels in town could provide up to 350 rooms during construction without affecting tourist or convention business. Most construction workers prefer rental units which provide some kitchen facilities. Motel rooms are generally less desirable than R.V. parks or mobile home units. Big Smoky Valley has very few rental units vacant; Tonopah has numerous motel rooms, but there are few available rental units and rental costs are relatively high.

If the Christensen Ranch R.V. park is developed, adequate housing at the new village would be available for those workers preferring to locate there. Multi-family housing availability would not be adequate in Tonopah under existing conditions and additional mobile home rental units in the Big Smoky Valley would be required for the average construction workforce.

During peak construction from March through August of 1988, a maximum of 416 non-local direct workers and 33 non-local indirect workers would locate within the study area. At this time, tourist-related temporary housing demand would also be greatest. Construction workers housed in motel accommodations may affect the availability of rooms for travelers and tourists passing through Tonopah in May, June, July, and August.

It is also unpredictable what military activities will be going on in 1988. Previously, the Air Force has reserved up to 362 rooms for a 6-week period during Green Flag and Red Flag operations (Dickinsheets 1987). If these operations locate in Tonopah again in 1988 as has been suggested, the housing demand would exceed the housing supply during the peak construction period from March through May.

Table 3.10-5 shows potential housing deficits during the peak and average construction period.

There is an abundance of developable land in the Tonopah and Big Smoky Valley area, but several constraints exist for developers including: the unavailability of construction financing, land costs, the limited supply of contractors and construction labor, the risk associated with developing in an unstable economic setting such as Tonopah and the Big Smoky Valley. Land development is occurring but mainly for permanent, owner-occupied units. However, certain land owners have expressed interest in developing more R.V. sites and motel rooms in the Carver's area.

A shortage of housing creates several related problems if not resolved in a timely manner. Overcrowding in units that are available may cause worker dissatisfaction and high employment turnover rates that

TABLE 3.10-5

EXISTING HOUSING SUPPLY AND ESTIMATED PROJECT-RELATED IMPACTS

	Existing Vacant Supply		Project Related	Supply Surplus/
	R.V.-Rental Units	Motels	Demand	<Deficit>
Construction Phase				
Tonopah				
Peak	3 (varies)	~ 350	125	<47>
Average	3 (varies)	~ 350	14 (1988)	<3>
New Townsite				
Peak	200	0	228	<28>
Average	200	0	191	9
Smoky Valley				
Peak	0	1	62	<61>
Average	0	1	51	<50>

are both expensive and potentially socially disruptive. Construction workers, in particular, may camp randomly in the project area creating conflicts with private land owners and occupancy trespass problems for federal land managers.

With the development of the new village, housing would not be a major problem during the operations phase. The proposed new village would have a total of 100 single-family lots developed by late 1987, and another 100 by early 1988. Full build-out would include a total of 435 village lots and 61 1-acre lots.

The estimated new household demand during operations is 67, which would be adequately covered in the proposed expansion.

After the project is completed, vacancy rates in the study area would increase unless there is an unmet housing demand from other economic activity in the area in 2002.

3.10.6 Public Facilities and Services

Health. Construction of the SVCO expansion would result in new population migrating into the study area. This in-migration would not present a serious problem for health care facilities and services because there is excess capacity at the facilities. The Nye General Hospital occupancy rate is currently only about 21 percent (Higginbottam 1987). Resident physician caseloads would increase slightly. The higher occupancy rates and caseloads are within the capacity of the existing health care system.

Law Enforcement. The SVCO expansion is expected to have moderate adverse effects on the Nye County Sheriff's Department. During the construction phase, a substantial number of persons are expected to move to the area in search of employment at the mine. Many transients would be unable to find a job and would be financially unable to leave the area or establish a residence. This situation, like that which has occurred with other mines in prior years, would foster increased workloads in the area of alcohol-related problems and traffic offenses for the Sheriff's Department (Zane 1987). The provision of adequate housing would be important in reducing the level of public disturbance during construction. The department would experience increases in caseloads during peak construction periods. The Nye County Sheriff's Department may need to adjust the number of officers and patrols in some areas to avert problems.

The operations phase would not have a significant impact on the demand for law enforcement services.

Fire. As described in Chapter 2, fire protection in Nye County is provided primarily by volunteer rural organizations. Serious fires in the area may be fought through the cooperative efforts of several local departments. The proposed mine expansion would have firefighting capacity available at the plant to provide fire protection, including a fire truck with plant employees manning the truck in the event of a fire (Earl Cole, Round Mountain Fire Brigade).

The fire protection and rescue services provided in Tonopah and Round Mountain are adequate for existing and future needs with the expansion. The project-induced population would require additional volunteers at the Smoky Valley Volunteer Fire Department, but adequate fire fighting equipment is available. The Smoky Valley Volunteer Fire Department is already understaffed. Also, the increased population would supplement the staffing levels of the volunteer programs.

Social Services. Dramatic increases in the caseloads of social service agencies serving Nye County has occurred in the past during large project startup periods (Christiensen 1987). These are due to the in-migration of a large number of persons and their families looking for employment. A similar situation is expected to develop during the hiring period for the expansion which would markedly increase the demand for social services. Nye County Social Services does not have the staff and facilities to accommodate this demand so adjustments would be necessary to meet increased caseloads.

Increased caseloads likely to occur would include transient population assistance, domestic violence, and child abuse. If the construction workforce is not properly managed, social services issues could cause significant problems within the study area.

Utilities. Utilities, including electricity and telephone service, would adequately meet existing and projected future demand. Project-related demand for electricity would be met by the new substation. The new village would have adequate electrical service provided by the new sub-station.

Schools. School-age children migrating to the study area would be distributed to Nye County schools in proportion to the expected population increases. Enrollment impacts would be greater during the peak construction phase than during operations.

The Nye County School District would receive a significant enrollment impact, but would also benefit from increases in the tax base. Tables 3.10-1, 3.10-2, and 3.10-3 show the expected number of new project-related children by school level for peak and average construction periods and operations. During the peak enrollment period in 1988, the project is expected to result in a total student increase of 104. Average construction activity will impact the school district temporarily with an additional 62 students, and permanent operations families are expected to increase the school enrollment by 81 permanent primary and secondary students. This expansion will significantly affect the capacity of the elementary, junior, and senior high school facilities especially in Round Mountain, where the school is already at capacity levels.

Water and Sewer. The expansion would not result in significant impacts on Round Mountain, Tonopah, or the Big Smoky Valley water and sewer system. As described in Chapter 2, Tonopah has more than adequate water and sewer capacity to supply the proposed construction and operations workforce locating in Tonopah.

Most of the Big Smoky Valley residences have individual septic systems and individual wells. The Carver's area has a community water supply and distribution system, which has adequate capacity for expansion.

The new village water system is anticipated to have a normal pumping rate of 1,000 gpm with a peak rate of 5,000 gpm in the summer, and a 410,000-gallon storage tank and treatment facility.

Water supply and treatment is adequate for the proposed expansion. Wastewater treatment capacity will provide adequate service to the new population.

Solid Waste Disposal. The capacity of the existing county-operated landfill west of Round Mountain is sufficient to accommodate the increased population associated with the expansion. The landfill has an estimated remaining life of 18 years (Yates, A. 1987).

Community Buildings and Facilities. One of the most difficult issues associated with the expansion of the SVCO pertains to the capital costs associated with providing necessary public facilities to the new village. These facilities include a new school, gymnasium, library, fire station, town hall, police station and holding facility, and post office.

Currently the existing town of Round Mountain provides these facilities, but if the majority of the population of Round Mountain ultimately moves to the new village, these facilities would not serve their purpose at the old townsite.

The question arises as to what population threshold should trigger moving facilities and who should pay for the construction of the new buildings? RMGC has agreed to dedicate land at the new townsite for development of public facilities; they do not propose to construct and operate the facilities. RMGC will own and operate the water and sewer systems within the new village until the county or town is willing to take possession. They will also build, maintain, and operate recreational facilities such as the proposed 3-hole golf course, pool, and tennis courts. Access roads to the new village will also be maintained by the company until they are deeded to the county at which time the county will be responsible for maintenance.

Estimated capital costs for construction/relocation of the necessary public facilities are listed in Table 3.10-6.

If the new village is annexed to the existing Round Mountain taxing district, tax dollars and bonding capacities will be available to build new capital projects from mine, residential, and commercial property tax proceeds, as well as sales tax distribution from the state and county.

The new village could also create a new taxing district. This new district would be allocated ad valorem revenues and sales tax revenues

TABLE 3.10-6

NEW VILLAGE PUBLIC FACILITIES ESTIMATED CONSTRUCTION COSTS

Facility	Estimated Cost
School	$ 3,025,000[1]
Gymnasium	1,000,000[2]
Library	300,000[3]
Town Hall Relocation	3,000[4]
Post Office Relocation	70,000[5]
New Post Office	375,000[5]
Police	100,000[6]
Fire Station	100,000[7]
Total Capital Cost	$ 4,973,000

[1] Based on $55/sq. ft., 110 sq. ft. per primary school student with an estimated student capacity of 500 (Johnson 1987).

[2] Based on $130/sq. ft., 7,700 sq. ft. (Johnson 1987).

[3] The town of Round Mountain will have $250,000 budgeted for a new library by 1988. They have also secured a $70,000 state grant for library construction. They would like to locate the library on the same site as the new school (Lyons 1987).

[4] Based on moving the existing town hall from Round Mountain to the new village (Lyons 1987).

[5] Moving the existing Round Mountain facility would cost between $65,000 and $70,000. Construction of a new facility would cost an estimated $375,000 (Ehmert 1987).

[6] Based on a modern facility with an office and holding cell (Zane 1987).

[7] Based on construction of a new fire station similar to the existing station in Round Mountain (Berg 1987).

based on a percentage of the Maximum Allowed Combined Revenue in the county. The new village would have its own assessed valuation, and therefore bonding capacity for capital improvements.

One area where potential financing difficulties are being experienced is the area of school facilities. The Nye County school district encompasses the entirety of Nye County. Therefore, all of Nye County must approve a bond election for a new school at the new village. The size of the district makes it difficult to get county approval for a specific capital project, due to the increased tax burden county-wide.

Other revenue sources available to finance the capital projects discussed in this section will be discussed in the mitigation section.

3.10.7 Cumulative Impacts

The principal economic activities in Nye County relate to mining and military activity. Currently, the U.S. Air Force and the U.S. Department of Energy are major employers in Nye County and surrounding counties. The Nevada Test Site (Department of Energy) employs approximately 8,000 people. Nellis Air Force Base employs 15,000 (Dickinsheets 1987), and the Tonopah Test Range employes approximately 500 (Kravonic 1987).

The Air Force anticipates a stable employment and economic influence on the area except during the Green Flag Operation which occurs annually in March or April for 6 weeks. At this time the Air Force moves between 300 and 500 trainees to the area and occupies a large percentage of the motel accommodations in the Tonopah area. This influx of Air Force trainees in March 1988, during peak construction, would cause additional competition for housing in the Tonopah area. There could potentially be conflicts between Air Force personnel and construction workers, which would increase law enforcement calls for response.

The Nevada Test Site and Tonopah Test Range have no plans to expand operations in the Tonopah area.

Mining activity in Nye, Mineral, and Esmeralda Counties is escalating. Employment related to mining activity varies from 10 to 300 depending on the size of the operation. Currently, an estimated 1,020 miners are employed in the surrounding areas. It is expected that mining exploration and production will increase considerably during the next several years. Since Tonopah is somewhat of a regional trade center, it would benefit from the effects of increased mining activity. There may be additional negative impacts related to housing if miners prefer to locate in Tonopah. These impacts cannot be quantified. No new large-scale projects have been proposed to the BLM at this time.

No Action Alternative

The No Action Alternative consists of continuation of SVCO mining activities under current production rates. Under this scenario, economically recoverable reserves would be depleted by 1988 due to the rapidly increasing strip ratio of the mine. At that time, the mine and plant facilities would be dismantled and reclaimed, resulting in the loss of the present 400 SVCO jobs plus secondary employment.

In the case of the No Action Alternative, RMGC would not develop the Christensen Ranch property as a new employee housing development. As the mine and existing plant facilities were closed, it is anticipated that SVCO employees would leave Round Mountain to seek employment elsewhere. There would be reduced tax revenues to the county and to the Nye County School District.

Operation of company-owned public services would be transferred to new ownership, including water and sewer systems, day care facilities, and road maintenance. The level of services provided by the county would decrease (e.g., sheriff, school facilities, and ambulance service) in proportion to the decline in population. It is also anticipated that some private retail businesses in Round Mountain would cease operation. Other residential development and business viability in the Smoky Valley would also decline.

Mining and Processing Alternatives

The socioeconomic effects of the mining and processing alternatives would be the same as for the Proposed Action.

Employee Housing Alternatives

New Employee Transportation to and from Tonopah. This alternative anticipates a majority of the construction workers and new permanent company employees locating in Tonopah, approximately 60 miles from the minesite.

Tables 3.10-7 and 3.10-8 show the impacts of the Tonopah housing alternative on study area employment, population, household allocation and school children, during construction and operations.

It is assumed that 65 percent of the construction phase employees would locate in Tonopah, which would add an estimated 165 households in Tonopah. With a current rental vacancy rate in Tonopah of 3 percent, additional housing would need to be constructed for the construction workforce. As discussed in Chapter 2, adequate land is available for residential development but new development for such short-term demand is unlikely.

If 20 percent of the construction workforce bring their children, there would be an estimated average of 41 school-age children who would attend the Tonopah schools. There is adequate capacity to handle the additional students.

The remaining 35 percent of the average construction workforce would reside in the Big Smoky Valley. The incremental household impact to the area would be 90. Currently there is no vacant housing available in the Big Smoky Valley. It is assumed that additional temporary housing development would occur near the minesite in the Carver's area. The population impact in the Big Smoky Valley area would total 129 with 22 additional school children. These new children would impact the existing school facilities. One modular unit provides classroom space for 25 students. The school district will have a total of three modular units to house the current student population in 1987-88; therefore, an additional unit would be required.

Although it is assumed that RMGC would transport the majority of the workers on buses, additional construction workers commuting to and from Tonopah may cause traffic problems during the construction phase. Law enforcement officers would have increased caseloads dealing with alcohol-related and traffic-related accidents. Public services and facilities would only be impacted for a short period of time during the construction phase. Water and sewer, health, and fire protection services are adequate to serve the increased population. Social services and recreational facilities may be adversely affected by the increased population during construction.

TABLE 3.10-7

TONOPAH ALTERNATIVE

SVCO EXPANSION

PROJECTIONS OF EMPLOYMENT, POPULATION, HOUSING, AND SCHOOL AGE CHILDREN BY LOCATION

CONSTRUCTION PHASE[1]

	Local[2] Direct	Non-Local[2] Direct	Total Direct	Local Indirect	Non-Local Indirect	Total[3] Indirect	Total
NEW EMPLOYMENT	28	255	283	31	20	51	334
NEW HOUSEHOLDS[4]							
Single		204			8		212
Married (1 Worker)		28			2		30
Married (2 Workers)		12			1		13
TOTAL		244			11		255

Location	Tonopah	New Village	Big Smoky Valley	Total
NEW HOUSEHOLDS[5]	165		90	255
NEW POPULATION[6]				
Single Household	143		77	220
Married Household	96		52	148
TOTAL	239		129	368
NEW SCHOOL CHILDREN[7]				
Secondary	8		4	12
Primary	33		18	51
TOTAL	41		22	63
HOUSING PREFERENCE[8]				
Single Family	8		0	8
Multi Family	33		0	33
Mobile Homes	25		54	79
Other (RV or Motel)	99		36	135
TOTAL[9]	165		90	255

TABLE 3.10-7 (CONTINUED)

Footnotes:

[1] The construction workforce is assumed to be 10 percent local, 90 percent non-local (BLM 1980). Local workers will commute to and from their place of residence to work on a daily basis (McMyler Kaiser Engineering 1987).

[2] Indirect construction employment is calculated using a construction employment multiplier of 1.2 based on 1978 employment location quotients and basic/nonbasic employment. It is assumed that 70 percent of the indirect labor force are second persons in the direct labor households (ERT 1980).

[3] The construction workforce is composed of 80 percent single workers or married without family, and 20 percent married workers with family (McMyler Kaiser Engineering 1987; ERT 1987).

[4] During construction, 65 percent of the workforce will locate in Tonopah, 35 percent throughout the Big Smoky Valley.

[5] Population estimates are based on one person per household for single households for direct workers, 2 persons per household for indirect workers, and 3.5 persons per household for married households (BLM 1980).

[6] Eighty percent of school-age children are primary students, 20 percent secondary students (BLM 1980).

[7] Housing preferences are shown based on the following percentage distribution.

	Tonopah	Big Smoky Valley
Single Family (SF)	5%	--
Multi Family (MF)	20%	--
Mobile Home (MH)	15%	60%
Other (RV site or motel)	60%	

[8] Totals on tables may not add up due to rounding errors.

TABLE 3.10-8

TONOPAH ALTERNATIVE

SVCO EXPANSION

PROJECTIONS OF EMPLOYMENT, POPULATION, HOUSING, AND SCHOOL AGE CHILDREN BY LOCATION

OPERATIONS PHASE[1]

	Local[2] Direct	Non-Local[2] Direct	Total Direct	Local Indirect	Non-Local Indirect	Total[3] Indirect	Total
NEW EMPLOYMENT	4	67	71	22	15	37	108
NEW HOUSEHOLDS[4]							
Single		17			4		21
Married (1 Worker)		27			6		33
Married (2 Workers)		11			2		13
TOTAL		55			12		67

Location	Tonopah	New Village	Big Smoky Valley	Total
NEW HOUSEHOLDS[5]	60		7	67
NEW POPULATION[6]				
Single Household	19		2	21
Married Household	146		16	162
TOTAL	165		18	183
NEW SCHOOL CHILDREN[7]				
Secondary	12		1	13
Primary	50		6	56
TOTAL	62		7	69
HOUSING PREFERENCE[8]				
Single Family	33		2	35
Multi Family	10		0	10
Mobile Homes	15		4	19
Other (RV or Motel)	3		0	3
TOTAL[9]	61		6	67

TABLE 3.10-8 (CONTINUED)

Footnotes:

[1] The new operations workforce is assumed to be 5 percent local and 95 percent inmigrants.

[2] Indirect operations employment is calculated using an operations employment multiplier of 1.55 (Nevada Bureau of Mines 1982). It is assumed that 70 percent of the indirect labor force are second persons in the direct labor households.

[3] The construction workforce is composed of 26 percent single workers and 74 percent married workers (Stonier 1987).

[4] During operations, 90 percent of the new employees would live in Tonopah, and 10 percent in the Big Smoky Valley.

[5] Population estimates are based on one person per household for single households and 3.5 persons per household for married households.

[6] Eighty percent of school-age children are primary students, 20 percent secondary students.

[7] Housing preferences are shown based on the following percentage distribution.

	Tonopah	Big Smoky Valley
Single Family (SF)	55%	30%
Multi Family (MF)	%15	--
Mobile Home (MH)	25%	70%
Other (RV site or motel)	5%	--

[8] Totals on tables may not add up due to rounding errors.

During the operations phase, it is assumed that 90 percent of the permanent workforce would commute from Tonopah to the jobsite. Buses would be used to transport personnel to and from the site. Assuming approximately 63 employees were to commute from Tonopah, and a bus would carry 50 people, approximately two bus trips would be made daily. New employees would purchase or rent vacant housing in Tonopah. Currently, there is adequate housing for sale for the permanent workforce; however, the cost of desirable housing is high relative to other areas of the state. Rental housing in Tonopah is not readily available.

Most public facilities and services are adequate to serve the permanent population including water and sewer, law enforcement, fire protection, and health services.

Recreational facilities and programming need to be expanded to meet existing population demands. The addition of 165 new people in the Tonopah area would put added pressure on the existing operations.

The Big Smoky Valley area would be impacted by an estimated 7 new households during operations which represents a population increase of 18 people, including 7 school-age children. This population could be absorbed into the area without major impacts to public services and facilities including schools.

Round Mountain Townsite Expansion and Private Homesites in the Big Smoky Valley. With the implementation of this alternative, RMGC would not develop the Christensen Ranch property beyond the initial 29 homesites for SVCO management personnel. If new employee housing were not provided at the Christensen Ranch, new employees would likely purchase homesites in the Big Smoky Valley or locate on BLM land at the existing Round Mountain townsite.

The Round Mountain expansion alternative would be a difficult alternative because of the unresolved land ownership issue which was identified in Chapter 2. Since Echo Bay Mines (RMGC) has lode, placer, and mill site claims over a large area of the town, they have a legal right to mine the area. Land ownership in Round Mountain is not possible, due to the public ownership of the unpatented land. Therefore, residential expansion in the town would be dependent on Round

Mountain Gold Corporation making mineable land available for residental use. In addition, the current water supply in Round Mountain is inadequate, and the system would need to be upgraded and expanded.

Tables 3.10-9 and 3.10-10 show the impact of the Round Mountain townsite expansion on study area employment, population, households and school-age children during construction and operations.

During the construction phase, it is assumed that 60 percent of the construction workers would locate in Tonopah, 10 percent in Round Mountain, and 30 percent in the Big Smoky Valley. These three areas would all experience impacts associated with growth. These impacts have been discussed in the Tonopah employee housing alternative. The remainder of the construction workers would locate in Round Mountain. Currently rental housing is not readily available in the area. RMGC would need to provide land from its surface rights for residential use in order to accommodate the estimated 25 additional households in Round Mountain. Temporary housing would also need to be provided in Tonopah and the Big Smoky Valley.

If 20 percent of the construction workers locating in Round Mountain and the Big Smoky Valley bring their children, an estimated additional 25 students would require enrollment in the already crowded Round Mountain school facility. One additional modular unit would be required to house the additional construction-related students.

The total estimated average population increase during construction would total 37 people in Round Mountain, 221 people in Tonopah, and 110 people in the Big Smoky Valley. During peak construction, these numbers would be significantly higher for a short period of time. The impact on public services and facilities would be significant in Round Mountain and the Big Smoky Valley.

During operations, it is assumed that 70 percent (47 households) of the permanent workforce would locate at the Round Mountain townsite, 25 percent (17 households) in the Big Smoky Valley, and 5 percent (3 households) in Tonopah.

This allocation would require improvements to the water system in Round Mountain and residential development in Round Mountain and the Big Smoky Valley. Most public services and facilities in Round Mountain would need upgrading or expansion.

TABLE 3.10-9
ROUND MOUNTAIN EXPANSION ALTERNATIVE
SVCO EXPANSION
PROJECTIONS OF EMPLOYMENT, POPULATION, HOUSING, AND SCHOOL AGE CHILDREN BY LOCATION
CONSTRUCTION PHASE[1]

	Local[2] Direct	Non-Local[2] Direct	Total Direct	Local Indirect	Non-Local Indirect	Total[3] Indirect	Total
NEW EMPLOYMENT	28	255	283	31	20	51	334
NEW HOUSEHOLDS[4]							
Single		204			8		212
Married (1 Worker)		28			2		30
Married (2 Workers)		12			1		13
TOTAL		244			11		255

Location	Tonopah	New Village	Big Smoky Valley	Total
NEW HOUSEHOLDS[5]	153	25	77	255
NEW POPULATION[6]				
Single Household	132	22	66	220
Married Household	89	15	44	148
TOTAL	221	37	110	368
NEW SCHOOL CHILDREN[7]				
Secondary	8	1	4	13
Primary	31	5	15	51
TOTAL	39	6	19	64
HOUSING PREFERENCE[8]				
Single Family	8	20	0	28
Multi Family	31	0	0	31
Mobile Homes	23	5	46	74
Other (RV or Motel)	92	0	30	122
TOTAL[9]	154	25	76	255

TABLE 3.10-9 (CONTINUED)

Footnotes:

[1] The average construction workforce is 283 over the 18-month construction period. The peak workforce of 462 will occur for 3 months starting in March 1988.

[2] The construction workforce is assumed to be 10 percent local, 90 percent non-local (BLM 1980). Local workers will commute to and from their place of residence to work on a daily basis (McMyler Kaiser Engineering 1987).

[3] Indirect construction employment is calculated using a construction employment multiplier of 1.2 based on 1978 employment location quotients and basic/nonbasic employment. It is assumed that 70 percent of the indirect labor force are second persons in the direct labor households (ERT 1980).

[4] The construction workforce is composed of 80 percent single workers or married without family, and 20 percent married workers with family (McMyler Kaiser Engineering 1987; ERT 1987).

[5] During construction, 60 percent of the workforce will locate in Tonopah, 10 percent in the existing town site at Round Mountain, and 30 percent in the Big Smoky Valley.

[6] Population estimates are based on one person per household for single households with direct workers, 2 persons per household for indirect workers, and 3.5 persons per household for married households (BLM 1980).

[7] Eighty percent of school-age children are primary students, 20 percent secondary students (BLM 1980).

[8] Housing preferences are shown based on the following percentage distribution.

	Tonopah	New Village	Big Smoky Valley
Single Family (SF)	5%	80%	--
Multi Family (MF)	20%	--	--
Mobile Home (MH)	15%	20%	60%
Other (RV site or motel)	60%	--	40%

[9] Totals on tables may not add up due to rounding errors.

TABLE 3.10-10

ROUND MOUNTAIN EXPANSION ALTERNATIVE

SVCO EXPANSION

PROJECTIONS OF EMPLOYMENT, POPULATION, HOUSING, AND SCHOOL AGE CHILDREN BY LOCATION

OPERATIONS PHASE[1]

	Local[2] Direct	Non-Local[2] Direct	Total Direct	Local Indirect	Non-Local Indirect	Total[3] Indirect	Total
NEW EMPLOYMENT	4	67	71	22	15	37	108
NEW HOUSEHOLDS[4]							
Single		17			4		21
Married (1 Worker)		27			6		33
Married (2 Workers)		11			2		13
TOTAL		55			12		67

Location	Tonopah	New Village	Big Smoky Valley	Total
NEW HOUSEHOLDS[5]	3	47	17	67
NEW POPULATION[6]				
Single Household	1	15	5	21
Married Household	8	113	41	162
TOTAL	9	128	46	183
NEW SCHOOL CHILDREN[7]				
Secondary	1	10	3	14
Primary	3	39	14	56
TOTAL	4	49	17	70
HOUSING PREFERENCE[8]				
Single Family	2	7	3	12
Multi Family	1	1	0	2
Mobile Homes	1	39	13	53
Other (RV or Motel)	0	0	0	0
TOTAL[9]	4	47	16	67

TABLE 3.10-10 (CONTINUED)

Footnotes:

[1] The new operations workforce is assumed to be 5 percent local and 95 percent inmigrants.

[2] Indirect operations employment is calculated using an operations employment multiplier of 1.55 (Nevada Bureau of Mines and Geology 1982). It is assumed that 70 percent of the indirect labor force are second persons in the direct labor households.

[3] The construction workforce is composed of 26 percent single workers and 74 percent married workers (Stonier 1987).

[4] During operations, 5 percent of the new employees would live in Tonopah, 70 percent in Round Mountain, and 25 percent in the Big Smoky Valley.

[5] Population estimates are based on one person per household for single households and 3.5 persons per household for married households.

[6] Eighty percent of school-age children are primary students, 20 percent secondary students.

[7] Housing preferences are shown based on the following percentage distribution.

	Tonopah	Round Mountain	Big Smoky Valley
Single Family (SF)	66%	15%	30%
Multi Family (MF)	34%	2%	--
Mobile Home (MH)	0	83%	70%
Other (RV site or motel)	--	--	--

[8] Totals on tables may not add up due to rounding errors.

The greatest impact would be to the school. An additional 70 permanent school children would require three new modular units at the current facility.

Parks and recreational amenities are limited at the existing townsite. Recreational facilities and programs would need to be upgraded to adequately serve the new and existing population.

Police and fire protection and ambulance service are adequate to serve the new Round Mountain population. However, the Smoky Valley Volunteer Fire Department requires additional volunteers to serve the existing population.

Increased expenditures would be required for routine maintenance of roads and streets in Round Mountain.

3.10.8 Energy Consumption

The proposed expansion would utilize electrical power and diesel fuel. Minor amounts of gasoline would also be consumed for vehicular use. Electricity would be received at 230 kilovolts from the Sierra Pacific Power Company; a new substation would be constructed to supply this power. The estimated maximum kilowatt demand is 11,532.

Diesel fuel consumption would increase from approximately 11,155 gallons per day in 1985 to 16,901 gallons per day (6,000,000 gallons annually) in late 1987. A percentage of the trucks necessary for the expansion were purchased in 1984 and 1985 and are currently in use. Current consumption is 15,211 gallons per day. The annual 6 million gallons per year consumption is anticipated to remain relatively constant through the operations phase. This represents an incremental annual consumption of about 2,040,000 gallons (based on 1985 actual consumption) for expanded activities. Although the total consumption would rise proportionally with the tonnage mined, consumption per unit (ton) produced would likely decrease due to more economical hauling methods (larger trucks), as well as energy-related benefits of economies of scale.

Two of the mining and processing alternatives involve the use of conveyors rather than trucks for the transport of ore and waste rock. RMGC's feasibility studies have analyzed the energy demands for both mining technologies. As increasing tonnages are moved by conveyor (in comparison to truck haulage), primary energy demand would shift from utilization of diesel fuel to use of electricity. RMGC's studies have shown that conveyor haulage may be more economical under certain conditions due to lower operating costs; however, that economic advantage is largely due to rising costs of diesel fuel, labor, etc., and it is likely that energy consumption for either method of mining would be approximately equivalent when one considers the quantities of energy consumed in producing the two forms of energy proposed for use.

Workers commuting to and from the minesite on a daily basis also consume fuel. Because of daily commutes required to and from the mine site from Tonopah, the Tonopah employee housing alternative would greatly increase fuel consumption, compared to the other employee housing alternatives.

3.11 Transportation

Proposed Action

The proposed project would increase traffic on area highways to some degree and, secondarily, would marginally increase road maintenance costs and traffic accident risks. None of these effects would be considered significant.

Estimates of traffic increases were made using the population distribution developed in the socioeconomic analysis (Section 3.10). The traffic analysis was conducted for the peak-hour period using the peak construction employment of 462 workers and the total operations employment increase of 70 workers. The following assumptions were also made:

- All construction workers would work a single day shift.
- Operations workers would work three shifts with 50 percent of the new workers on the day shift and 25 percent each on the remaining two shifts.
- Each worker would drive a private vehicle to work separately, generating one vehicle trip per worker arriving and one per worker departing.

The assumptions are considered to be very conservative. Construction workers, in particular, often average two or more occupants per vehicle, especially if long travel distances are involved.

The results of the peak-hour traffic analysis are presented in Table 3.11-1. The proposed expansion would result in only moderate peak-hour traffic increases, even during the short-term peak construction activity in mid-1988. Levels of service on area highways would be sustained at "A" levels throughout the construction and operations periods.

Increased highway maintenance requirements associated with increased traffic from the proposed expansion would not be measurable. Increased traffic, particularly at the intersection of the project access road with S.H. 376, would increase the risk of accidents to some degree, but there are long, unobstructed views of approaching traffic on S.H. 376 and very low traffic levels on the highway. Consequently, the intersection is relatively safe, and any increase in accident risk would be minor.

In summary, project-related effects on highway transportation in the vicinity of the SVCO would not be significant. There would be no measurable effect on other transportation systems in the region from the proposed expansion.

No Action Alternative

The No Action Alternative would result in transportation activities continuing at current levels through closure and dismantling of the SVCO. Subsequently, traffic on area roads and highways would be reduced. The effects would not be significant.

Mining and Processing Alternatives

Mining and processing alternatives would not substantively affect transportation in the area.

Employee Housing Alternatives

New Employee Transportation to and from Tonopah. Implementation of this alternative would potentially result in ten peak-hour bus trips from Tonopah to the project site and back during construction and two

TABLE 3.11-1

PEAK HOUR TRAFFIC EFFECTS OF THE PROPOSED SVCO EXPANSION

	S.H. 376 South of SVCO		S.H. 376 Between SVCO and Carver's	
	Peak Construction[1]	Operations	Peak Construction[1]	Operations
Existing Traffic[2]	49	49	89	89
Project Related Increase[3]	139	3	69	8
TOTAL	188	52	158	97
Peak Hour Capacity[4]	1,100	1,100	1,100	1,100
Volume/Capacity Ratio	0.17	0.05	0.14	0.09
Level of Service	A	A	A	A

[1] Mid-1988.

[2] Estimated at 15 percent of average annual daily traffic (AADT).

[3] Assumes 1 occupant per vehicle. Commuting traffic from the existing Round Mountain townsite and the new village is not included because this traffic would not use S.H. 376.

Traffic distribution is based on population distribution from Section 3.10. For construction, a single shift was assumed with 30 percent assigned to Tonopah (south of SVCO), 15 percent to Smoky Valley (predominantly north of SVCO), and the remainder to the new village. For operations, a 3-shift rotation was assumed with 50 percent on the 7:00 a.m. to 4:00 p.m. shift and 25 percent each on the 4:00 p.m. to 11:00 p.m. and 11:00 p.m. to 7:00 a.m. shifts. Thus, 75 percent, or 53 of the new workers would commute during the morning and evening peak hours. Residential distribution of the new operations workers was assumed to be 5 percent to Tonopah, 15 percent to Smoky Valley, and 80 percent to the new village for the proposed SVCO expansion.

[4] Barry 1987.

peak-hour bus trips during operations. This would reduce the risk of accidents slightly compared with the proposed project but would not significantly affect area highway traffic. Locating the new workers in Tonopah would increase traffic in and near Tonopah, but area streets and roads have sufficient capacity to accommodate the increase. No significant transportation effects would be expected.

Round Mountain Townsite Expansion. Estimated effects on S. H. 376 from expansion of the existing Round Mountain Townsite are presented in Table 3.11-2.

Levels of service on S. H. 376 south of SVCO would decline slightly to a "B" level during the peak construction period in 1988. This minor, short-term traffic effect would not be considered significant because even at their worst, service levels would remain well above the "C" level typically used as a design objective for rural highways.

Maintenance requirements would increase somewhat on unpaved roads in and near Round Mountain. None of the transportation effects of this alternative would be considered significant.

Reclamation Alternatives

Reclamation alternatives would not affect public transportation in the project area.

3.12 Recommended Mitigation and Monitoring Measures

This section identifies possible mitigation and monitoring measures. These measures are designed to: 1) minimize significant adverse impacts identified in the environmental impact analysis, 2) provide additional design recommendations for RMGC to consider in final engineering, and 3) meet the anticipated requirements of state and federal permits. This list includes specific measures that would be implemented by the BLM or other regulatory agencies and measures that may be implemented by RMGC.

TABLE 3.11-2

PEAK HOUR TRAFFIC EFFECTS OF THE ROUND MOUNTAIN TOWNSITE EXPANSION ALTERNATIVE

	S.H. 376 South of SVCO		S.H. 376 Between SVCO and Carver's	
	Peak Construction[1]	Operations	Peak Construction[1]	Operations
Existing Traffic[2]	49	49	89	89
Project Related Increase[3]	277	3	139	14
TOTAL	326	52	228	103
Peak Hour Capacity[4]	1,100	1,100	1,100	1,100
Volume/Capacity Ratio	0.30	0.05	0.21	0.09
Level of Service	B	A	A	A

[1] Mid-1988.

[2] Estimated at 15 percent of average annual daily traffic (AADT).

[3] Assumes 1 occupant per vehicle. Commuting traffic from the existing Round Mountain townsite and the new village is not included because this traffic would not use S.H. 376.

Traffic distribution is based on population distribution from Section 3.10. For construction, a single shift was assumed with 60 percent assigned to Tonopah (south of SVCO), 30 percent to Smoky Valley (predominantly north of SVCO), and the remainder to the Round Mountain. For operations, a 3-shift rotation was assumed with 50 percent on the 7:00 a.m. to 4:00 p.m. shift and 25 percent each on the 4:00 p.m. to 11:00 p.m. and 11:00 p.m. to 7:00 a.m. shifts. Thus, 75 percent, or 53 of the new workers would commute during the morning and evening peak hours. Residential distribution of the new operations workers was assumed to be 5 percent to Tonopah, 25 percent to Smoky Valley, and 70 percent to Round Mountain for the Round Mountain townsite expansion alternative.

[4] Barry 1987.

3.12.1 Air Resources

Measure A-1: Measures to control air pollutant emissions are included in the design of the proposed mine and processing facilities. Continued air quality monitoring may be required under the provisions of the permit issued by Nevada Division of Environmental Protection.

3.12.2 Geology and Mineral Resources

Mitigation measures specific to geologic hazard potential are included in the project as designed (e.g., pit wall safety benching and slope reduction of waste dumps and the leach residue pile). Additional measures recommended as part of the mitigation and monitoring efforts are as follows:

Measure G-1: As part of the reclamation effort, and tailored specifically to whichever reclamation alternative is selected, it is recommended that access be restricted in those areas (shaped waste dumps, leach residue pile) being reclaimed until vegetative cover (if utilized) or other surface materials are fully established. After completion of mining, livestock will be restricted until the vegetation is reestablished.

3.12.3 Water Resources

Measure WR-1: Pablo Creek and Jett Creek channels should be monitored because channel shifting may potentially cause flooding in the proposed village site. If channel shifting becomes a potential problem, channel training or diversion will be required. A right-of-way permit would be obtained from the BLM, if necessary.

3.12.4 Vegetation

Measure V-1: Short-term disturbance of vegetation is an unavoidable consequence of the proposed expansion. Long-term loss of vegetative cover and productivity would be mitigated by implementing clamation Alternative B or C on disturbed areas associated with the ion.

3.12.5 Land Use

Measure LU-1: Fencing of the new village, access roads, and airstrip is recommended to prevent livestock access to the village and livestock/vehicle encounters on the roads and airstrip. It is recommended that one continuous area be fenced to exclude livestock rather than fencing individual areas. The fenced area would be as follows (see Figure 3.12-1).

- The western edge of the access road to the west of the village.
- The northern boundary of the village and across the northern edge of the airstrip.
- The eastern edge of the airstrip.
- The northern and southern edges of the east-west access road between S.H. 376 and the village.
- The southern boundary of the village.

The estimated cost for this fencing is $16,600.

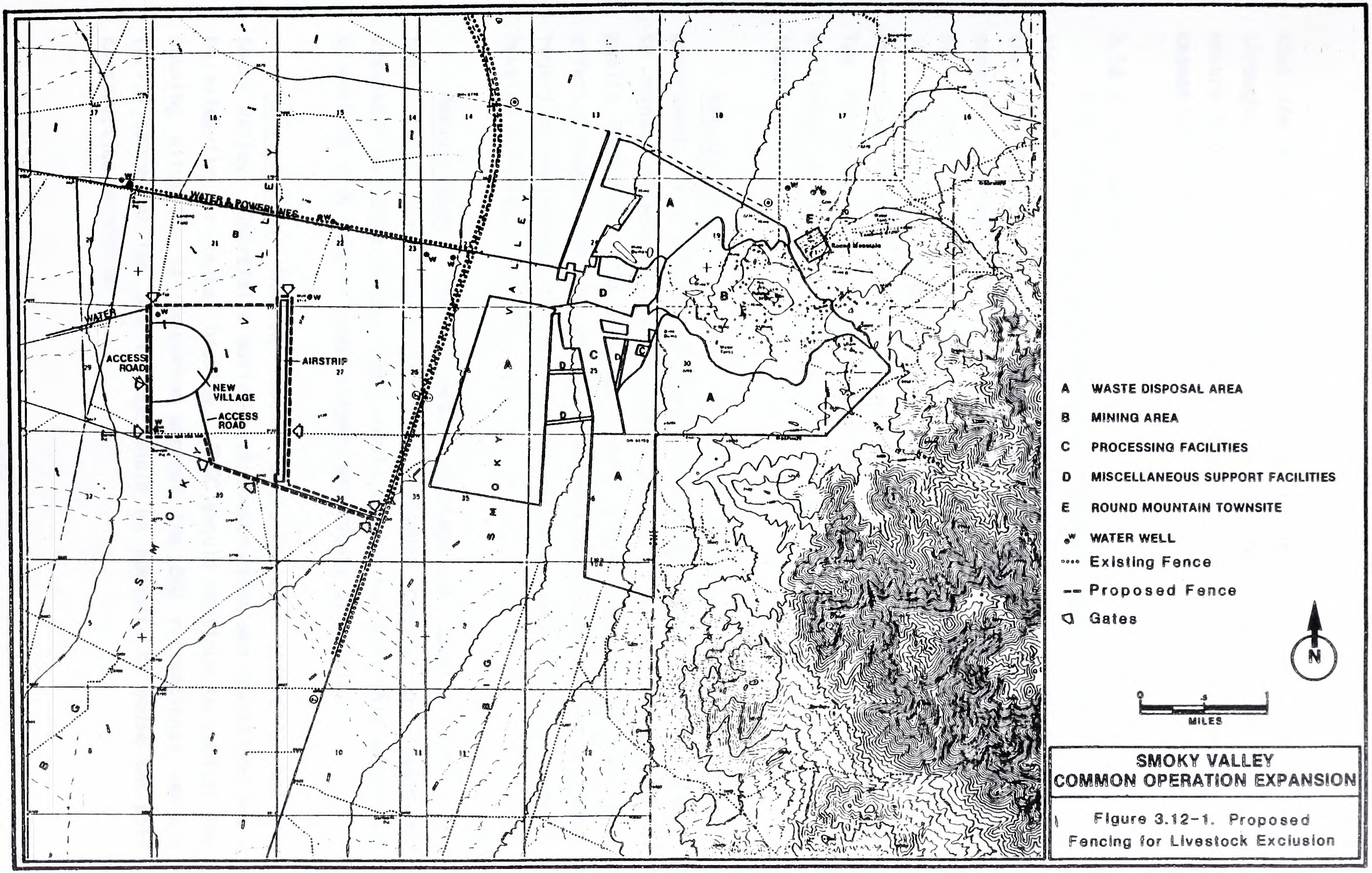
3.12.6 Cultural Resources

Measure CR-1: Avoidance, testing, or documentation of the three cultural resources sites considered potentially eligible for nomination to the National Register of Historic Places (NRHP) is recommended due to potential direct impacts from the proposed expansion. These sites include 433-88, CRNV-61-2182, and 433-98.

Site 433-156 should be protected from future disturbance and/or evaluated for eligibility to the NRHP. The evaluation should include interviews with Native Americans and local residents, and archaeological testing.

3.12.7 Aesthetics

Measure A-1: If the proposed leach residue pile is selected, it is recommended that the pile be initiated as far to the east as is feasible. As the pile is gradually expanded, it should be kept as far back (east) from S.H. 376 as possible at all times. This will ensure



SMOKY VALLEY
COMMON OPERATION EXPANSION

Figure 3.12-1. Proposed Fencing for Livestock Exclusion

that the visual impact will be minimized at any given point in time throughout the active life of the pile. As a result, it will also ensure that the long-term visual impact will be minimized when the mine ceases operations.

3.12.8 Socioeconomics

Three adverse socioeconomic impacts were identified in Section 3.10: 1) a housing shortfall during the construction phase of the SVCO expansion and during operations for the Round Mountain townsite expansion alternative; 2) existing school facilities are at capacity and would require additional space to house the new student population; and 3) fiscal impacts and financial considerations of constructing and operating new public facilities at the new employee housing development. The following measures have been identified to provide a range of available options that could be implemented to ameliorate adverse impacts.

Measure SE-1: Provision of current project information to local governments is a critical mitigating factor to enable planning agencies to respond effectively to projected changes in housing and demand for public facilities and services. RMGC should continue to work with affected communities and provide county officials with current estimates regarding employment, project startup and completion dates, and company housing policies.

Measure SE-2: The projected shortage of housing during the construction phase could lead to prolonged camping or "occupancy trespass" on public lands. RMGC should attempt to limit this occurrence by working with federal land managers and county officials.

Measure SE-3: Housing impacts would be most severe in the Big Smoky Valley. Shortfalls during both construction and operations would be primarily for rental housing. RMGC should continue to monitor the housing situation to determine whether the 200 recreational vehicle (R.V.) spaces at the new village would be adequate to house the peak construction workforce.

Possible options for minimizing housing shortages during construction include the following:

- RMGC could provide transportation or encourage contractors to provide transportation for inmigrant construction workers to and from Tonopah where workers can be accommodated in motels.
- RMGC could encourage private development of campgrounds/ trailer parks that would have public services to accommodate construction worker mobile homes and recreation vehicles in the Big Smoky Valley.
- RMGC or construction contractors could reserve motel rooms in advance for peak periods of construction.
- RMGC could provide additional temporary accommodations for construction workers in Tonopah at the airport development. This would reduce the impact on temporary accommodations and rental housing and effectively locate workers in areas with public services, rather than on public lands.

Measure SE-4: Housing shortages are projected to continue through the operations phase of the project for the Round Mountain townsite expansion alternative. RMGC should continue to monitor the housing situation and provide housing in Round Mountain or encourage permanent housing construction by private developers within the Big Smoky Valley.

Measure SE-5: In order to help counter the projected financial burden of capital expenditures for new public facilities at the new village, the county could: 1) request supplemental funds from the state/county/city relief tax reserve funds to cover increased expenditures for the induced population; 2) request prepayment of taxes to reduce the lag time between construction impacts and tax receipts; and 3) negotiate with the county to earmark new net proceeds revenues for priority capital projects, especially a new school. If these requests were granted by the state, it would increase revenues to the Nye County budget for increased expenditures caused by the inmigrating population.

Measure SE-6: In order to help counter the projected financial burden of providing additional classroom space for mine-related construction and operations children at the existing school, the mine could purchase additional modular units to meet the incremental increases in school enrollment associated with mine expansion. The cost of the unit(s) could be reimbursed to RMGC when tax revenues from mine operations become available to the Nye County School District. Modular units are estimated at $40,000 per unit; one unit would house 25 students.

3.13 Summary and Comparison of Alternatives

3.13.1 Summary of Impacts

Table 3.13-1 summarizes the potential impacts associated with the proposed SVCO expansion. Information included in the table was derived from the analyses for specific resources in Sections 3.1 through 3.11. Additionally, Table 3.13-1 provides perspective for balancing the various impact conclusions by reviewing the impacts in terms of the following criteria:

- Is the impact considered beneficial or adverse? The terms beneficial and adverse are subjective, of course, however judgements are made regarding the overall nature of the projected change. These judgements are made in terms of the specific affected resource only.

- Is the impact avoidable or unavoidable? An avoidable impact is one that may be minimized or prevented if the recommended mitigation measures included in Section 3.12 are implemented. Certain impacts, however, would be unavoidable consequences of the proposed mine and heap leach operations.

- What is the duration of the impact? Here, short term is defined as the 15-year project life. Long-term impacts would last beyond the project life. These time frames are important in evaluating the overall trade-offs between the short-term use of the land for mineral extraction and long-term future uses.

- Would the impact represent either an irreversible impact or an irretrievable commitment of resources?

As shown in Table 3.13-1, implementation of RMGC's proposed Plan of Operations for the SVCO expansion would result in both beneficial and adverse impacts. The beneficial impacts are primarily social and economic, deriving from increases in employment opportunities, tax revenues, and economic activity resulting from the proposed expansion.

TABLE 3.13-1

SUMMARY OF IMPACTS OF THE PROPOSED SVCO EXPANSION

Resource/Impact	Beneficial or Adverse	Unavoidable	Short-Term	Long-Term	Irreversible or Irretrievable	Mitigation Measures Identified
Air Resources						
Increased particulate matter emissions	A	Yes	Yes	No	No	Yes
Geology and Mineral Resources						
Potential creation of unstable slopes	A	No	No	Yes[1]	No	Yes
Extraction of gold and silver	B	Yes	Yes	Yes	Yes	No
Water Resources						
Potential flooding of the new village due to shifting of stream channels	A	Yes	Yes	Yes	No	Yes
Soils						
Disturbance of 2,332 acres of soil resources	A	Yes	Yes	Yes[2]	No	No
Increased erosion on disturbed areas	A	Yes	No	Yes[2]	No	No
Loss of topsoil resource on non-salvaged areas	A	No[1]	Yes	Yes	Yes	No
Vegetation						
Disturbance of 2,332 acres of vegetation	A	Yes	Yes	Yes[2]	No	Yes

TABLE 3.13-1 (CONTINUED)

Resource/Impact	Beneficial or Adverse	Unavoidable	Short-Term	Long-Term	Irreversible or Irretrievable	Mitigation Measures Identified
Wildlife						
Disturbance of 2,332 acres of wildlife habitat	A	Yes	Yes	Yes[2]	No	No
Increased direct and indirect mortality and harassment of wildlife	A	Yes	Yes	No	No	No
Land Use						
Conversion of rangeland to industrial use	B,A	Yes	Yes	No[2]	No	No
Livestock conflicts with residential areas and vehicle encounters	A	No	Yes	Yes	No	Yes
Cultural Resources						
Direct disturbance of 3 sites	A	No	Yes	Yes	Yes	Yes
Indirect disturbance of 1 site	A	No	Yes	Yes	Yes	Yes
Visual Resources						
Increased visual contrasts	A	Yes	Yes	Yes[2,3]	No	Yes
Socioeconomics						
Increased population	B, A	Yes	Yes	No	No	No
Increased employment	B	Yes	Yes	No	No	No

TABLE 3.13-1 (CONTINUED)

Resource/Impact	Beneficial or Adverse	Unavoidable	Short-Term	Long-Term	Irreversible or Irretrievable	Mitigation Measures Identified
Increased economic activity	B	Yes	Yes	No	No	No
Increased Nye County revenues	B	Yes	Yes	No	No	No
Increased Nye County expenditures for services	A	Yes	Yes	No	No	Yes
Create housing shortage	A	No	Yes	No	No	Yes
Increased School Enrollment	A	No	No	Yes	No	Yes

[1] Extent of impact depends on the reclamation alternative selected.

[2] Duration of impact depends on the reclamation alternative selected. Alternatives B and C would shorten the impact duration and are assumed here. Alternative A would result in long-term soils, vegetation, wildlife, visual, and land use impacts at the project site.

[3] The selection of the proposed leach residue pile near S.H. 376 would result in an unavoidable adverse impact to visual resources; however, implementation of Reclamation Alternative B or C would reduce long-term visual impacts to an acceptable level. Selection of the alternative leach residue pile location together with the implementation of Reclamation Alternative B or C at the alternative location would eliminate the significant impact to visual resources.

Not all of the social impacts would be beneficial, however, as housing demand is expected to exceed supply, and Nye County, Tonopah, and Round Mountain are expected to experience added fiscal burdens to provide facilities and services for the inmigrant population. Additional adverse impacts are associated with site-specific disturbances required to construct and operate proposed facilities.

Many of the adverse impacts summarized in Table 3.13-1 are unavoidable. These impacts are necessary consequences of any mining and heap leach operation. For example, vegetation and soil disturbances are required for facilities construction, particulate matter emissions cannot be completely eliminated, and certain visual impacts associated with new and expanded facilities are unavoidable. Other impacts listed in the table can be avoided or further reduced by implementing the mitigation and monitoring measures identified in Section 3.12.

Most of the impacts identified for the SVCO expansion would be short-term effects that would not extend beyond the project life. The conversion of rangeland/wildlife habitat to industrial use would be a long-term consequence of the mining development although the overall duration of the effect depends greatly on final decisions regarding reclamation approaches. Most disturbed lands could eventually be returned to post-mining uses as rangeland and wildlife habitat.

Finally, few of the impacts identified represent either irreversible impacts or irretrievable commitments of resources. By design, the geologic formations of the open-pit mine would be irreversibly changed during mining, and the gold and silver produced would be irretrievable once shipped to market. Such changes are the purpose of the proposed mining development. With the exception of the rangeland/wildlife habitat removed by the mine itself, other land commitments would be reversible after mining operations cease and reclamation plans have been implemented. Disturbance of cultural resource sites would be irreversible, although mitigation programs are designed to recover valuable information from the sites. Soil losses on areas where topsoil is not salvaged would be irreversible.

3.13.2 Comparison of Alternatives

Chapter 1 listed four types of alternatives to be evaluated in the EA: the No Action Alternative; three mining and processing alternatives; two employee housing alternatives; and three reclamation alternatives. These alternatives were discussed in appropriate places in the discussions for individual resources. The following paragraphs summarize the conclusions reached regarding the various alternatives, highlighting the trade-offs associated with each.

No Action Alternative. The No Action Alternative is included in the EA as required by NEPA, although BLM regulations allow BLM to reject a proposed Plan of Operations only under conditions where the proposal would violate certain federal or state laws or would result in the undue or unnecessary degradation of federal lands. The environmental analysis did not identify conditions that would constitute undue or unnecessary degradation, given environmental protection and engineering features included in the Plan of Operations and the mitigation recommendations incorporated into the EA. Violations of federal or state law appear unlikely, although several agencies must still evaluate specific design proposals and permit applications.

The No Action Alternative would preclude expansion of the SVCO. Thus, the environmental impacts listed in Table 3.13-1 would not occur. The No Action Alternative would preclude the development of economically significant precious metals reserves and associated beneficial employment and economic consequences. Similarly, it would avoid the short-term adverse impacts associated with facilities construction and operation.

Mining and Processing Alternatives. The differences in environmental impacts for the ore and leach residue conveyor alternatives are minimal. Slightly less particulate emissions would result from the use of conveyors. The leach residue pile location alternative would impact approximately 675 acres of the shadscale vegetation type; this is not considered significant. The selection of the leach residue pile alternative together with the implementation of Reclamation Alternatives B or C would avoid a significant impact to visual resources.

Employee Housing Alternatives. The alternative of transporting new employees to and from Tonopah would require additional housing in Tonopah for the construction workforce. Assuming that 35 percent of the construction workforce locates in the Big Smoky Valley, additional temporary housing and additional temporary classroom space would be required in the valley. Additional law enforcement officers would be required on a short-term basis.

During operations, the permanent housing, school facilities, and other public services and facilities in Tonopah and the Big Smoky Valley should be adequate for the increased population associated with transporting employees to and from Tonopah. Additional rental housing and recreational facilities in Tonopah would be required to meet the additional demand associated with this alternative.

The expansion of the existing Round Mountain townsite and the location of employees in the Big Smoky Valley would result in a shortage of temporary housing, school facilities, and public services in the area during construction. During operations, the water supply system at the townsite would require upgrading, and additional school and recreational facilities would be necessary. Increased expenditures for road maintenance in Round Mountain would also be required.

Reclamation Alternatives. The three reclamation alternatives evaluated represent a range of reclamation intensity, with Alternative A being a low level of reclamation intensity and Alternatives B and C being higher levels. The major differences between approaches are that Alternative A would not include topsoil salvage and would rely on natural reinvasion for plant establishment. Alternatives B and C would include some topsoil salvage and reapplication combined with seeding of adapted plant species. Active revegetation efforts would be restricted to the leach pad and leach residue dump areas under Alternative B; revegetation would be attempted on all areas except the mine pit under Alternative C.

Important differences were identified between the reclamation approaches that affect impact conclusions under soils, vegetation, wildlife, visual resources, and land use. Basically, vegetation and soils specialists concluded that revegetation of disturbed areas is possible at the SVCO expansion areas if topsoil is salvaged and reapplied, seedbeds are properly prepared, a suitable seed mixture is planted, and precipitation is adequate. It should be recognized that this area has strong fluctuations in precipitation, and the probability of reclamation success would vary accordingly. Areas actively revegetated could be returned to productive post-mining land use as rangeland and wildlife habitat. In contrast, natural invasion of the large disturbed areas appears unlikely under Alternative A. Productive post-mining land use would be unlikely and disturbed areas could experience locally severe erosion and slope instability.

Under Reclamation Alternative B, about 2.3 million cubic yards of soil would be required. Under Reclamation Alternative C, about 4.4 million cubic yards of soil would be required. Soils available on each component site are generally sufficient to retopsoil the same area during revegetation. Salvageable soil resources, shown on Figure 3.4-1, are sufficient to retopsoil disturbed areas to a target depth of 10 inches.

The three reclamation alternatives also have important differences in terms of their economic cost. Reclamation Alternative A would be the least expensive option, B would be the next most expensive option, and C the most expensive option. Estimates of the overall costs of the three reclamation approaches are summarized in Table 3.13-2. A major portion of the costs of Alternatives B and C is associated with topsoil handling. As discussed in Section 3.4, direct hauling is recommended where possible to minimize handling costs.

TABLE 3.13-2

ESTIMATED RECLAMATION COSTS FOR THE SVCO EXPANSION

Item	Alternative A	Alternative B	Alternative C
Removal of Foundations	NA	NA	$ 2.5 million
Benching of Waste Dumps[1]	NA	$ 5.1 million	$21.3 million
Topsoil Salvage, Stabilization, and Reapplication	NA	$ 4.7 million	$ 8.0 million
Revegetation with Adapted Grass and Shrub Species (Seedbed Preparation, Seeding, Fertilizing, etc.)	NA	$ 1.7 million	$ 4.1 million
TOTAL COST	0	$11.5 million	$35.9 million

[1] Costs assume reduction of steep slopes on waste piles to 25° or less and the leach residue pile to 18° or less per the recommended mitigation measures identified under Section 3.4, Soils.

4.0 CONSULTATION AND COORDINATION

This Environmental Assessment (EA) was prepared by a Bureau of Land Management (BLM) interdisciplinary team with assistance from ERT, of Fort Collins, Colorado. Table 4-1 provides a list of the preparers and the qualifications and responsibilities of each in the preparation of the EA.

4.1 Public Involvement

The EA for the Smoky Valley Common Operation expansion was prepared to BLM standards. The BLM, as the lead agency, implemented public and interagency consultation and coordination during the development of the EA.

4.1.1 Public Scoping

Prior to development of the Draft EA, BLM completed a formal public scoping process. This process included: news releases regarding the proposed expansion and the EA process; mailing of scoping documents to agencies, organizations, and individuals; public scoping meetings in Tonopah and Round Mountain; meetings with Nye County Commissioners and the Round Mountain Town Board; and informal discussions with many local, state, and federal agencies.

The public involvement process contributed significantly to the development of the EA by providing information to the EA team and by focusing the analysis on specific issues of concern to commenters. Issues raised during the scoping process are summarized below by environmental discipline.

Socioeconomics

Increased demand for community services, including: schools, police protection, fire protection, medical services, sanitation facilities, water supply, electrical service, and recreation facilities.

Positive economic impacts from the mine expansion related to increased job opportunities in the area.

Opportunity for improved quality of life from development of a planned residential community at Christensen Ranch.

TABLE 4-1

LIST OF PREPARERS

Name	Education/Experience	Responsibility
Bureau of Land Management		
Roger Oyler Technical Specialist	B.S. (Agricultural Range Management) 12 Years Professional Experience	Range and Wilderness
Victor Ross Technical Specialist	B.S. (Mining Engineering) 8 Years Professional Experience	Project Manager for BLM, Mineral Resources
Lee Grover Technical Specialist	B.S. (Wildlife) 34 Years Professional Experience	Wildlife, Visual Resources, Recreation
Dave Sjaastad Technical Specialist	B.A. (Ecology/Biology) B.S. (Range Management) 9 Years Professional Experience	Soils, Vegetation, Range, Livestock
Margaret Waski Technical Specialist	B.A. (Anthropology) 4 Years Professional Experience	Cultural Resources
ERT		
Russell T. Moore Project Advisor	Ph.D. (Ecology) B.S. (Range Management) 13 Years Professional Experience	Overall Project Direction and Quality Review
Valerie Randall Project Manager EA Manager	B.A. (Urban Studies) 9 Years Professional Experience	EA Manager, Coordination, Planning, Quality Review, Agency Liaison
Howard Gebhart Discipline Manager	M.S. (Meteorology) B.S. (Professional Meteorology) 9 Years Professional Experience	Air Resources Discipline Manager
Edith Linn Technical Specialist	B.A. (Physics and Mathematics) 1 Year Professional Experience	Air Resources
James Nyenhuis Technical Specialist	M.A. (Communications Theory) M.S. Candidate (Soil Science) B.A. (History, Psychology, Speech) 10 Years Professional Experience	Soils, Reclamation
Robert C. Sanz Technical Specialist	B.S. (Zoology) 12 Years Professional Experience	Wildlife
Philip Hackney Technical Specialist	M.S. Candidate (Range Ecology) B.S. (Botany) 9 Years Professional Experience	Vegetation, Reclamation

TABLE 4-1 (CONTINUED)

Name	Education/Experience	Responsibility
Bernhard Strom Technical Specialist	M.C.R.P. (City and Regional Planning) B.S. (Urban Planning) 15 Years Professional Experience	Visual Resources, Noise, Land Use, and Transportation
Jennifer Kathol Technical Specialist	B.S. (Natural Resource Economics) 10 Years Professional Experience	Socioeconomics and Recreation
Michael Warfel Technical Specialist	M.S. (Geology) B.S. (Geological Engineering) 11 Years Professional Experience	Groundwater
Thomas Demlow Technical Specialist	M.S. (Civil Engineering) B.S. (Civil Engineering) 15 Years Professional Experience	Surface Water
James Beck Technical Specialist	M.B.A. Candidate B.S. (Mining Engineering) 12 Years Professional Experience	Geology
Archaeological Research Services, Inc.		
Thomas Burke Technical Specialist	Ph.D. (Anthropology) M.A. (Anthropology) B.A. (Anthropology) 19 Years Professional Experience	Cultural Resources
Rainshadow Associates		
Ana Koval Technical Specialist	B.S. (Building Sciences) 8 Years Professional Experience	Historical Architecture

Positive economic impacts on the state and county economy from increased employment, purchasing power, and revenue.

Safety hazards associated with a new electric power substation and transmission lines.

Potential impacts on energy use and incorporation of appropriate conservation measures.

Potential disturbance of the cemetery at Round Mountain.

Viability of the proposed new facilities relative to the company's profitability over time; concern over public investments made in support of the new facilities.

Impacts on existing housing supply from temporary construction workforce.

Cultural Resources

Disturbance of cultural resources in the project area by construction and operation activities or through the indirect effects of increased local population.

Potential impacts to archaeological and historic resources within the Round Mountain townsite from the proposed expansion activities.

Transportation

Increased traffic on existing highways in the project area resulting in increased traffic hazards and higher maintenance costs.

Land Use

Potential long-term loss of rangeland productivity unless area is adequately reclaimed.

Impacts of the proposed expansion on adjacent National Forest lands. The Toiyabe National Forest is coordinating with the BLM in the preparation of the EA.

Impacts on livestock permitees in project area both during operations and following reclamation.

Water Resources

Impacts on groundwater from use of geothermal fluids to extend the heap leaching operation through the winter months; effects of disposal of spent geothermal fluids. (This analysis will be conducted in a subsequent EA for the use of geothermal fluids.)

Potential impacts of cyanide contamination on groundwater.

Wildlife

Additional harvest and possible disturbance of game and nongame wildlife resources of the project area.

4.1.2 Review of the Draft EA

The Draft EA was distributed to approximately 200 federal, state, and local agencies and interested individuals for review and comment. Letters of comment were received from the Nevada Prospectors Association and various state agencies (through the State Clearinghouse). Specific comments, both written comments and verbal comments from the public meetings, were used by the BLM in developing the Final EA. The written letters and BLM responses are included in Section 4.3.

4.2 Lists of Agencies and Organizations Consulted

Various federal, state, and other agencies were consulted during preparation of the EA. The following agencies, groups, and individuals, several of which have provided input, received copies of the Draft EA.

Federal

U.S. Bureau of the Census

- U.S. Department of Agriculture
  - Forest Service
    - Toiyabe National Forest
    - Tonopah Ranger District
  - Soil Conservation Service
    - Tonopah Soil Survey Field Office
    - Reno State Office

- U.S. Department of Defense
  - Nellis Air Force Base

- U.S. Department of Energy
  - Tonopah Test Range

- U.S. Department of the Interior
  - Bureau of Indian Affairs, Nevada Indian Agency
  - Bureau of Land Management
    - Nevada State Office
    - Battle Mountain District Office
  - Fish and Wildlife Service, Reno

U.S. Environmental Protection Agency

U.S. Postal Service

U.S. House of Representatives
    Barbara Vucanovich

U.S. Senate
    Chic Hecht
    Harry Reid

State of Nevada

Department of Conservation and Natural Resources
    Division of Environmental Protection
    Division of Historic Preservation and Archaeology
    Division of Water Resources

Department of Education

Department of Highways

Department of Human Resources
    Health Division
    Welfare Division
    Employment Security Department, White Pine
    Department of Taxation

Governor Richard Bryan

Nevada State Clearinghouse

City and Local

Nye County
    Cooperative Extension Service
    Administrator
    Assessor
    Board of Commissioners
    General Hospital
    Planning Department
    School District
    Sheriff's Department
    Social Services
Round Mountain Fire Department
Round Mountain Town Board
Smoky Valley Volunteer Fire Department
Tonopah Chamber of Commerce
Tonopah Town Manager
Western Shoshone National Council

Private Organizations

Citizen Alert
D&D Tire Company

Private Organizations (Continued)

Darrough Brothers
FMC Corporation
Gateway Gazette
Nevada Miners and Prospectors Association
Nevada Mining Association
Nevada Prospectors Association
Planning Information Corporation
Puckett Investments
Sierra Club, Toiyabe Chapter
Sierra Pacific Power Company
Trish Rippie Realty

Individuals

Pam Allen, Round Mountain, NV
Jenny, Amahl, Round Mountain, NV
Bob Anderson, Round Mountain, NV
Stacy Arnston, Round Mountain, NV
Joe K. Baker, Round Mountain, NV
Ben & Jane Baker, Round Mountain, NV
W. Bard, Smoky Valley, NV
Arthur A. & Hazel Barr, Round Mountain, NV
Charles R. Bennett, Round Mountain, NV
Karla Berg, Round Mountain, NV
Karl W. Berg, Round Mountain, NV
W. and Donna Berg, Round Mountain, NV
Robert & Cathy Berg, Round Mountain, NV
Ken and Bobbie Berg, Round Mountain, NV
Denver & Abbey Berg, Round Mountain, NV
Helen Berg, Round Mountain, NV
Ann Berg, Round Mountain, NV
Russell & Patricia Berg, Round Mountain, NV
Larry & Cheryl Berg, Round Mountain, NV
W.G. & Betty Bettencourt, Round Mountain, NV
Rosemary Birchim, Austin, NV
Oscar & Helen Boeshans, Round Mountain, NV
Steve Bradhurst, Reno, NV
Steve Brower, Round Mountain, NV
Bob & Patty Burns, Round Mountain, NV
Ben & Diane Canfield, Round Mountain, NV
Gary E. Carver, Round Mountain, NV
Richard Carver, Round Mountain, NV
Margaret Carver, Smoky Valley, NV
Getla Chivers, Round Mountain, NV
Don & Nancy Cirac, Austin, NV
Herman Clark, Round Mountain, NV
Earl & Donia Cole, Round Mountain, NV
Alan Cox, Sparks, NV
Gary & Betty Crane, Round Mountain, NV
Keith Dagel, Round Mountain, NV
David Deike, Sparks, NV
A.J. Douchane, Round Mountain, NV
Gloria Dougherty, Round Mountain, NV
Gerald & Janet Doyle, Round Mountain, NV
Reeve M. & Jean Duhme, Round Mountain, NV
Greg Earle, Hawthorne, NV
Dennis & Joni Eastley, Manhattan, NV
H.B. Elson, Round Mountain, NV
Mike Fannin, Round Mountain, NV
Steve Forshey, Round Mountain, NV
Ed & Emma Forshey, Round Mountain, NV
Charles L. Fox, Tonopah, NV
Butch Fuson, Tonopah, NV
Nick and Sandee Guglielmo, Round Mountain, NV
Margaret Hanie, Round Mountain, NV
L. C. Hansen, Round Mountain, NV
Hank Hayes, Round Mountain, NV
David L. Haynes, Round Mountain, NV
Donald Haynes, Round Mountain, NV
Charles W. Hill, Round Mountain, NV
Rae Hon, Round Mountain, NV
Dale & Betty Hoops, Round Mountain, NV
Maria Johnson, Round Mountain, NV
Raymond & Sarah Johnson, Round Mountain, NV
Ann Kee, Round Mountain, NV
Jim Keller, Round Mountain, NV
Pete Kesl, Round Mountain, NV
David Kiltey, Round Mountain, NV
Emil & Margaret Klava, Round Mountain, NV
Bill & Gayle Kretschmer, Tonopah, NV
Jimmy & Marlene Lucero, Round Mountain, NV
Keith and Marnella Lyons, Round Mountain, NV
Frank & Norma Lytle, Round Mountain, NV
Ralph D. Malholf, Round Mountain, NV
George Manley, Round Mountain, NV
Darrald Marshall, Round Mountain, NV
S. Mateer, Round Mountain, NV
Kent McAdoo, Elko, NV
Sandra S. McCormick, Silver City, NV
Frank & Ann McCracken, Round Mountain, NV
Lloyd McEvers, Round Mountain, NV
Greg McNulty, Round Mountain, NV
Tom Miche, Sparks, NV
Victor and Mary Ann Miller, Round Mountain, NV
D. Mitchell, Round Mountain, NV
Les Monroe, Las Vegas, NV
Wayne Montgomery, Round Mountain, NV
Butch and Cindy Moore, Manhattan, NV
Roger Morones, Golden Heights, NV
James A. Moss, Reno, NV
W.R. Osterhoudt, Round Mountain, NV
John Padgett, Round Mountain, NV
Leslie W. Parsons, Round Mountain, NV
Gerald L. Parsons, Hawthorne, NV
Carol A. Peed, Round Mountain, NV
Myrtle Perkins, Round Mountain, NV

Individuals

Melvin & Karen Petersen, Round Mountain, NV
Leon & Wenneva Petersen, Round Mountain, NV
Nikki Pilcher, Round Mountain, NV
John & Mary Powell, Round Mountain, NV
Ken and Carrie E. Power, Round Mountain, NV
R. Proffitt, Round Mountain, NV
Robert & Kathy Quick, Jr., Round Mountain, NV
Bob Ragar, Tonopah, NV
Henry E. Raines, Round Mountain, NV
David L. Rascon, Round Mountain, NV
James B. Rasmussen, Round Mountain, NV
Julean K. Rawson, Round Mountain, NV
Hugh E. Riley, Jr., Round Mountain, NV
Joe Santos, Elko, NV
Thomas Scheffel, Round Mountain, NV
Tressa Schmidt, Round Mountain, NV
Sally Schumacher, Round Mountain, NV
Greg & Susie Scott, Round Mountain, NV
Richard Sewing, Newcastle, UT
Joan Shangle, Eureka, NV
Richard Shelley, Round Mountain, NV
Nadene & Kelley Smouse, Round Mountain, NV
Curtis Stahl, Round Mountain, NV
D. Sternan, Round Mountain, NV
Michael & Stacie Stevenson, Round Mountain, NV
Dan & Julie Stevenson, Round Mountain, NV
Meade Stirland, Reno, NV
Carol Stonier, Round Mountain, NV
S. Taliaferro, Round Mountain, NV
Rose Taylor, Reno, NV
Valerie Thomas, Tonopah, NV
Brian & Sherry Toole, Round Mountain, NV
George Tucker, Round Mountain, NV
Leo & Wanda Vath, Round Mountain, NV
Jerry & Carol Vining, Round Mountain, NV
Larry Wahrenbrock, Silver City, NV
Otto Walls, Round Mountain, NV
Fay Walters, Round Mountain, NV
Linda L. Weiss, Round Mountain, NV
T.P. Wells, Mountain, NV
Daniel West, Round Mountain, NV
Russ White, Round Mountain, NV
Mattie Williamson, Round Mountain, NV
Robert Williamson, Round Mountain, NV
John and Debby Witner, Round Mountain, NV
Lee & Debora Witner, Round Mountain, NV
Donald Witter, Reno, NV
Jack & Carolyn Wolfe, Round Mountain, NV
Warren D. Woods, Round Mountain, NV
R. Woodward, Round Mountain, NV
G. Wright, Round Mountain, NV
Judy Yates, Manhattan, NV
Evan Zimmerman, Round Mountain, NV

4.3 Comments on the Draft EA

Letters of comment on the Draft EA are reproduced on the following pages together with BLM responses to individual comments.

Letter 1

Members of the Board:
Francis Arizabe
Norman Frey
Harold Chisholm
Gladis Saxton
Effie Spicer

NEVADA PROSPECTORS ASSOCIATION, INC.
P.O. BOX 94
FALLON, NEVADA 89406
OFFICE OF THE PRESIDENT, Phone 702-423-6231

JUL 22 1987

MEMORANDUM:

ENVIRONMENTAL ASSESSMENT,
TONAPA BRANCH BUREAU OF LAND MANAGEMENT, Dated June, 1987

The idea of foreigners poking noses into totally local affairs is not in the field of Federal agencies to poke snoots into. The attempt to combine the Social activities and the financial, economical activities is equally improper in a most stupid way. This position represents the equally stupid intent to compel local Peoples to bend the Knee to those who are totally unaware of local conditions and therefore cannot possibly have knowledge of local Peoples and local conditions and local Peoples.

The social activities of the People in Smokey Valley are and must be left to the residents of Smokey Valley.

The financial and economic activities are likewise to the existing conditions of Smokey Valley and largely consist of hay cattle and hogs. Here again, the effort to combine two widely activities shows the complete lack of common sense and equally lack of consideration of the position the residents find necessary to survive. The other activities such as is proposed in the draft is an enormous display of literary nonsense, which may have cost in the sum of about three hundred thousand dollars ($300,000). This handiwork is not the end, only the beginning.

The present increase in other activities should and probably will have some effect in the Social and Economic effect and is not a matter to be anticipated. This enlargement of an operation now in progress will, as [illegible], have some effect, only the [illegible] of persons who are knowledgeable

Response to Letter 1

Your comment is noted.

local residents can predict changes of this kind validly....not those who are more interested in promoting their own ego rather than the prosperity of the Citizens of Smokey Valley.

The attempt to determine the answers to questions that can only increase the confusion and add nothing but confusion is absurd.

Imponderable questions that are impossible to answer simply prove this intent to make noise only. The attempt to determine imponderables that are in the unforeseeable future is to be avoided. Such things are more to be determined by the local People as they become in the presence of the future. The local Citizens of Dixie Valley can and will find the proper answers. This is the way representative Government was intended by the writers of the Constitution and thereby sets up representative Government.

The attempt for those Persons who are trying to determine the future activities of others is to be resisted. This attitude of these persons who are determined to force their phylosophy onto others into the future of representative Government will certainly follow bringing about the downfall of representative Government and the Constitution.

These imponderable items mentioned in the Environmental Assessment will become things that local Citizens will quite easily solve. Whereas the imponderable issues that these wonderous Persons are proposing for the future of Smokey Valley at this time are so stupendous as to be beyond the comprehension of WE THE PEOPLE. The real fact is that if and when these imponderables will become local issues that will be when they will become easily solvable by the local Peoples.

Whereas, the fact is that several of the numerous do-gooders will wiggle and persuade Congress to appropriate from 3 to 5 million dollars to support

Letter 1 (Continued)

of these do-gooders who have no actual knowledge of local in any Valley - Smokey or any other.

Not to forget Dixie Valley.

Thank you,

H. R. Conrad, President
Nevada Prospectors Association, Inc.

Letter 2

STATE OF NEVADA

RICHARD H. BRYAN
Governor

JEAN FORD
Director

OFFICE OF THE GOVERNOR
OFFICE OF COMMUNITY SERVICES
Capitol Complex
Carson City, Nevada 89710
(702) 885-4420

RECEIVED
BUREAU OF LAND MANAGEMENT
TONOPAH RESOURCE AREA
AUG 6 1987

August 4, 1987

Mr. Victor Ross, Geologist
Bureau of Land Management
Tonopah Resource Area
P.O. Box 911
102 Old Radar Base
Tonopah, Nevada 89049

Re: SAI NV 88300002 Project: Draft E.A., Smoky Valley Common Operation Expansion

Dear Mr. Ross:

Attached are the comments from the Nevada Departments of Agriculture and Wildlife, and the Division of Historic Preservation/Archeology concerning the above referenced project.

These comments constitute the State Clearinghouse review of this proposal as per Executive Order 12372. Please respond to the Division of Historic Preservation/Archeology regarding their concerns with a copy sent to the Clearinghouse.

Sincerely,

John B. Walker

John B. Walker, Coordinator
State Clearinghouse, NOCS/SPOC

JBW/11
Enclosures

Response to Letter 2

Response to the Division of Historic Preservation/Archeology is included as the response to Letter 5.

Letter 3

NEVADA STATE CLEARINGHOUSE

OFFICE OF COMMUNITY SERVICES
1100 EAST WILLIAM, SUITE 117
CARSON CITY, NEVADA 89710
885-4420

TO:

- ☐ Governor's Office
- ☐ Attorney General
- ☐ Administration
- ☒ Agriculture
- ☐ Commerce
- ☐ Community Services
- ☐ State Job Training Office
- ☒ Economic Development
- ☐ Education
- ☐ Employment Security Department
- ☒ Dept. of Minerals
- ☐ Equal Rights Commission
- ☐ Human Resources
- ☐ Indian Commission

- ☐ Labor Commission
- ☒ Legislative Counsel Bureau
- ☐ Library
- ☐ Prisons
- ☐ Public Service Commission
- ☐ Taxation
- ☒ Transportation
- ☐ UNR-Bureau of Mines
- ☐ UNR-Dept. of Range, Wildlife, and Forestry
- X ☒ Wildlife
- ☐ Press Room-Capitol Building
- ☐ Nuclear Waste Project Office
- ☐ SOICC
- ☐ State Communications Board

Conservation and Natural Resources

- ☒ State Lands
- ☐ Conservation Districts
- ☒ Environmental Protection
- ☐ Forestry
- ☒ Hist. Preservation & Archeology
- ☐ State Parks
- ☐ Water Planning
- ☒ Water Resources
- ☐ ______
- ☐ ______
- ☐ ______

FROM: John B. Walker, Coordinator

SAI NV # 88300002

PROJECT: Draft E.A., Smoky Valley Common Operation Expansion

Attached for review and comment is a copy of the aforementioned project. Please evaluate it with respect to:

1) the program's effect on your plans and programs;
2) the importance of its contribution to State and/or areawide goals and objectives;
3) its accord with any applicable law, order or regulation with which you are familiar and/or
4) additional considerations.

PLEASE SUBMIT YOUR COMMENTS NO LATER THAN 7/30/87. Type your comments if applicable, check the appropriate box below and return the form to this office. PLEASE DO SO EVEN IF YOU HAVE NO COMMENT on this particular project so that we may complete our processing. If you are unable to comment by the prescribed date, please notify this office. Reviewers may substitute this form with agency letterhead. If letterhead is used, please cite the SAI number listed above in your comment.

THIS SECTION TO BE COMPLETED BY REVIEWING AGENCY:

- ☐ No comment on this project
- ☐ Proposal supported as written
- ☐ Additional information (see below)
- ☐ Conference desired (see below)
- ☑ Conditional support (outlined below)
- ☐ Disapproval of funding (must specify reason below)

Comments: (use additional sheets if necessary)

We support the project but recommend that the livestock operator be compensated for the loss of grazing rights in the area.

JUL 09 1987

Thomas Ballard — Reviewer's Signature

Exec Director — Title

789-0180 — Phone

7/7/87 — Date

Response to Letter 3

Compensation to permittees or lessees for lost grazing use is not allowable. The Taylor Grazing Act (TGA) of 1934, and the Federal Land Policy and Management Act (FLPMA) of 1976, provide that a grazing permit or lease creates no right, title, interest, or estate in or to the land or resources held by the United States. Both acts state further that when lands are devoted to a use which will exclude livestock grazing, the permittee on lessee "shall receive from the United States a reasonable compensation for the adjusted value, to be determined by the Secretary concerned, of his interest in authorized permanent improvements placed or constructed by the permittee or lands covered by such permit..." (Section 402(g) FLPMA, emphasis added). Our records do not indicate that the mine expansion will affect any permitted improvements; therefore, no compensation can be made.

Letter 4

STATE OF NEVADA
DEPARTMENT OF WILDLIFE
1100 Valley Road
P.O. Box 10678
Reno, Nevada 89520-0022
(702) 789-0500

RICHARD H. BRYAN
Governor

WILLIAM A. MOLINI
Director

July 28, 1987

Mr. John B. Walker, Coordinator
State Clearinghouse
Office of Community Services
1100 E. William, Suite 109
Carson City, NV 89710

RECEIVED ON
JUL 30 1987
OFFICE OF
COMMUNITY SERVICES

RE: SAI NV #88300002

Dear John:

The Draft EA for the Smoky Valley Mine Expansion has been reviewed by Habitat personnel in Las Vegas. Additionally, the Department representative in Tonopah has provided input to this project during the formulation of the EA. The project will impact wildlife to some degree just by the expansion onto lands adjacent to the existing mine. The proposed ponds which will support the heap leach operation will be a hazard to wildlife, primarily migratory waterfowl, since it is in close proximity to wetlands in Smoky Valley. These ponds should be covered with netting or by whatever means the company deems appropriate.

If you have any questions or feel a need for further input, please advise.

Sincerely,

Willie

William A. Molini
Director

COP

Region III

Response to Letter 4

The pregnant solution which contains cyanide is contained within sumps. These sumps are not currently attracting wildlife. The larger ponds contain fresh water and do not pose a problem to birdlife. If mortalities are noted, the sumps will be immediately covered.

Letter 5

RICHARD H. BRYAN
Governor

STATE OF NEVADA

ROLAND D. WESTERGARD
State Historic Preservation Officer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF HISTORIC PRESERVATION AND ARCHEOLOGY
201 S. Fall Street
Capitol Complex
Carson City, Nevada 89710
(702) 885-5138

July 30, 1987

M E M O R A N D U M

TO: John Walker, Office of Community Services

FROM: Alice M. Becker, Staff Archeologist Alice M Becker

SUBJECT: DRAFT E.A., SMOKY VALLEY COMMON OPERATION EXPANSION
SAI NV# 88300002

The Division has reviewed the environmental assessment and BLM cultural resource report 6-1045(p) which was the result of an archeological, historic and architectural survey of the Smoky Valley expansion project area. Archeologists recorded 157 prehistoric and historic archeological sites, and 37 structures in the Round Mountain townsite were re-evaluated for National Register significance. Four archeological sites (CrNV-61-2182, 433-88, 433-98 and 433-156) have either been determined eligible or are considered potentially eligible for inclusion in the National Register of Historic Places. One building, the W. H. Berg House, is listed on the Register and several other structures may be eligible as a thematic historic district.

The above mentioned historic properties are within areas subject to direct and indirect impacts that will result from an expansion of the Smoky Valley Mining Operation. Before developing means of mitigating project related effects, the BLM is responsible for determining the eligibility of sites 433-98 and 156. A testing program should be developed for these two sites. Additionally, an historic context should be developed and all resources associated with the Bergs identified. Such a program should be developed in consultation with the Nevada SHPO as per 36 CFR 800.4.

Although testing has not been completed, sites 433-88 and CrNV-61-2182 are considered eligible for inclusion in the Register and are within the area of direct impact. The Berg House may be subject to indirect impacts. When testing is complete, BLM needs to determine project related effects and means of avoiding or mitigating adverse effects to eligible properties.

These comments are in accordance with the National Historic Preservation Act of 1966, as amended. If BLM has questions on how next to proceed BLM staff should call us.

AMB:emt

Response to Letter 5

CR6-1045
8100
(NV067.21)

AUG 5 1987

Ms. Alice Becker
Staff Archaeologist
State Historic Preservation Office
Division of Historical Preservation and Archaeology
201 Fall Street, Room 106
Carson City, NV 89710

Dear Ms. Becker:

This office is in receipt of the cultural resources report for the Round Mountain Gold Corporation expansion (BLM CR6-1045P).

An archaeological survey of the project area was conducted by ARS. In addition, both archaeological and architectural surveys were conducted of the town of Round Mountain, outside the project area.

The archaeological survey identified three areas of significance within the area of the proposed mine expansion, and one within the town of Round Mountain:

1. Jett Canyon Pipeline.
2. Jefferson-Shoshone Canyon Pipeline.
3. Fairview Mine Complex.
4. Three structures within the town of Round Mountain that may represent historic Shoshone occupation.

ARS has listed these four sites as either eligible or potentially eligible to the National Register. In reviewing the documentation, this office has determined both pipelines to be eligible to the Register, and the Fairview Mine Complex and the possible historic Shoshone structures to be potentially eligible. Management has determined that this area does not meet the criteria for eligibility as an historic mining district.

An architectural survey conducted by Rainshadow Associates re-documented the William H. Berg house, already listed on the National Register, and listed four other structures that may be eligible under Criteria B; the significant persons being the Berg family (C.L. Shuppy house, J.W. Berg house, Berg Garage, and the Round Mountain Post Office). The survey did not find the town of Round Mountain to be eligible as a district.

Response to Letter 5

This office agrees with the determination that the town is not eligible for the National Register. As discussed in a 7/29/87 phone conversation with your office, development of an historic context and identification of all resources connected with the Berg family is recommended in order to determine if the four structures are eligible.

All impacts to the town itself will be indirect; i.e., increase of activity within the surrounding area; possible abandonment of some of the structures if a new townsite is developed in the valley below; and the converse, the possibility of more people moving into the area. Destruction of cultural resources by the town residents could go on regardless of the mine's activity.

All sites located within the project area could be subject to direct impacts such as waste dumping, mining, construction, etc.

It is our opinion that "no adverse effects" is an accurate determination for the town of Round Mountain, and specifically for the William H. Berg house. However, vandalism, a crime unconnected with the federal undertaking proposed, is an on-going problem in management. In order to alleviate this problem we will recommend fencing off the possible historic Shoshone structures.

All sites within the project area will obviously be adversely affected. Our mitigation recommendations are as follows:

1. Avoid or document for National Register nomination the Jefferson Shoshone Canyon Pipeline.

2. Test the Fairview Mine Complex for National Register eligibility. If determined eligible, implement a data recovery plan.

3. Although the Jett Canyon Pipeline is considered National Register eligible and subject to adverse effects, we have received a legal opinion stating that the pipeline is the property of the mining company. We can only request, not require, avoidance or documentation of the pipeline.

We request your concurrence with these recommendations.

Sincerely,

/s/ Roger
Acting Area Manager

WASKI:jm:8/45/87:92C

Letter 6

STATE OF NEVADA

RICHARD H. BRYAN
Governor

JEAN FORD
Director

OFFICE OF THE GOVERNOR
OFFICE OF COMMUNITY SERVICES
Capitol Complex
Carson City, Nevada 89710
(702) 885-4420

AUG 13 1987

August 10, 1987

Mr. Victor Ross, Geologist
Bureau of Land Management
Tonopah Resource Area
P.O. Box 911
102 Old Radar Base
Tonopah, Nevada 89049

Re: SAI NV #88300002 Project: Draft E.A., Smoky Valley Common Operation Expansion

Dear Mr. Ross:

Attached is an additional comment from the Nevada Division of Environmental Protection that was received after our previous letter to you. Please incorporate this comment in your decision making process.

Sincerely,

John B. Walker

John B. Walker, Coordinator
State Clearinghouse, NOCS/SPOC

JBW/ll
Enclosure

Letter 6 (Continued)

RICHARD H. BRYAN, *Governor*

STATE OF NEVADA

Administration 702/885-4670
Air Quality 885-5065
Construction Grants 885-4870

Groundwater 702/885-4670
Waste Management 885-4670
Water Pollution 885-4670

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
201 South Fall Street
Carson City, Nevada 89710

CLEARINGHOUSE COMMENT

SAI NV# 88300002

Title: Draft E.A., Smokey Valley Common Operation Expansion

August 7, 1987

AIR: Gay McCleary

Round Mountain Gold may be subject to PSD review, since the expansion is considered a "major modification" to an existing major stationary source. It is essential that Round Mountain Gold submit applications at the earliest possible time in order for a review to be done to determine applicability of PSD.

WATER: Ralph Capurro-Harry van Drielen

Pit closure will be examined and procedures inserted into NEV700052. The objection is prevention of an open body of water which contains toxic species of minerals. No discharge can be authorized from mill except for events outside the design criteria. Final plans of the sewage treatment facility for the village will be submitted and reviewed/approved prior.

WASTE: Verne Rosse

NO COMMENT

GROUNDWATER: Harry van Drielen

Application NEV700052 has been filed for a water pollution control permit. Design and materials are under examination tentation decision is to draft and issue a zero discharge permit.

Response to Letter 6

As pollution control devices are designed for all sources, RMGC is submitting the applicable air quality permit applications.

Please refer to the response to Letter 4 regarding potential effects of the ponds on birdlife. The sewage treatment facility permit has been reviewed and approved.

The zero discharge permit has been issued.

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APPENDIX

BIRDS NOTED IN AND AROUND BARKER CREEK, NEVADA[1]

Species	Abundance	Time of Year
Red-tailed hawk	Fairly common	Year long
Kestrel	Fairly common	Year long
Chukar	Common	Year long
Cattle egret	Uncommon	Spring, fall
Killdeer	Fairly common	Spring, summer, fall
Mourning Dove	Fairly common	Spring, summer, fall
Poorwill	Fairly common	Spring, summer, fall
Common nighthawk	Common	Spring, summer, fall
Black-chinned hummingbird	Fairly common	Spring, summer, fall
Red-shafted flicker	Fairly common	Year long
Yellow-bellied sapsucker	Uncommon	Year long
Western kingbird	Common	Spring, summer, fall
Says Phoebe	Fairly common	Spring, summer, fall
Dusky flycatcher	Fairly common	Spring, summer, fall
Horned lark	Very common	Year long
Barn swallow	Common	Spring, summer, fall
Crow	Formerly common	Year long
Northern raven	Common	Year long
Black-billed magpie	Fairly common	Year long
Black-capped chickadee	Fairly common	Fall, winter, Spring
Sage thrasher	Uncommon	Year long
Robin	Common	Year long
Starling	Common	Year long
Wilson's warbler	Fairly common	Spring, summer, fall
Western meadowlark	Common	Spring, summer, fall
Brewer's blackbird	Common	Year long
Red-winged blackbird	Fairly common	Year long
Yellow-headed blackbird	Uncommon	Spring, summer, fall
Western tanager	Common	Spring, summer, fall
Black-headed grosbeak	Uncommon	Year long
Rufous-sided towhee	Common	Year long
Lazuli bunting	Common	Spring, summer, fall
Indigo bunting	Uncommon	Spring, summer, fall
Oregon junco	Common	Fall, winter, Spring
Gray-headed junco	Common	Year long
Lark sparrow	Fairly common	Spring, summer, fall
Sage sparrow	Common	Year long
Black-throated sparrow	Common	Spring, summer, fall
White-crowned sparrow	Common	Fall, winter, Spring
Fox sparrow	Uncommon	Year long

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[1] Observers - C. H. & A. Coleman, V. L. Grover.